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OCT. 24, 1949

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And because they were likeable teenagers, people liked to use the word "brave" when they visited their airport at Researcher, and their pilot, the old Greek legend of Icarus, who fell into the sun when the wax fastenings of his wings melted in the heat. It was not intended that such should fail.

The Wright boys learned quickly and went back to their work. They had to catch up. They had to go higher. The goal of the big sky was a fever in them.

So with their high school algebra and their bicycle repair tools, they went looking for the went that had escaped all the winds of all the ages.

One day they stopped away to a lonely stretch of beach at Kill Devil Hill. Here, alone with their vision and the sky, they built a strange mechanical bird of hickory sticks and muscle.

And they flew. And they gave the sky to all of us that day. Perhaps there is a reason why so many of the great dreams of mankind—the dream of wings, the dream of planes, the dream of security—have come true here, under the American sky. Perhaps it is because all out here higher where all are free to soar.

And maybe that is who nothing seemed impossible—or was—on the run over young fellows from Dayton, Ohio, whose eyes were always fixed at the sky.

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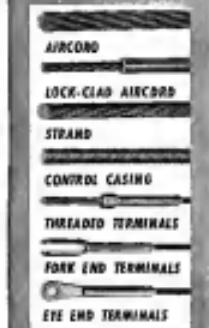
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# Aviation Week

Volume 51

October 24, 1949

Number 17

## The Aviation Week

The Bridge Visitor—A Staff Report

Bristol Projects Turboprop—  
New Supplier Firm Identified

21

## Headline News

Sixty-four Counter Attacks

Bristol Philosophy of Production

22

When Strike Effect Is Doubtful

Boeing Philosophy of Production

23

How Many Are Bound to "Buy" Brazil?

Aviation Sales and Services

24

For Major Shareholders

U.S.A. MacMullan Spray Plant

25

For Europe May Step to Cleveland

Air Transport

26

## Financial

McDonald Peckin-Dear War Peck

McDonald's Private Capital

27

## Departments

Aviation Calendar

Production Briefing

28

New Report

AF, Navy, R&D Information

29

Wiley White

Booking for Detroit

30

Industry Observer

Business Conditions

31

New Aviation Products

CAB Schedule

32

Letters

33

Robert H. Wood

33333

Meredith H. Stadelman 33333

William Koenig

James Murphy 33333

Robert E. Hess

John F. Kelly 33333

Irving Stone

Donald E. Miller 33333

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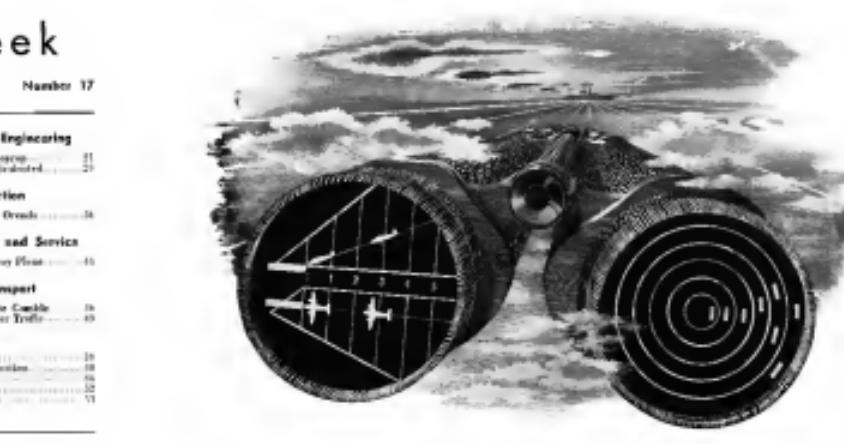
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# THE AVIATION WEEK

## The Budget Victory—A Staff Report

WASHINGTON—Air power won a major victory again as Capitol Hill last week with the Senate surrounding to intensify House pressure for funds to implement a \$5 group Air Force.

Senate approved next the record peacetime USAF budget appropriation to the White House where it faces its final test before passage.

For the aircraft industry the new USAF budget means

• New contract authorization of \$8,392,755,000. This is more than \$190 million above the original budget demanded by President Truman and case supported by the Senate.

• Procurement of 2938 new aircraft. This is 809 planes more than 1967 authorized in the President's budget. Additional planes will be 478 fighters, 356 transports, and 231 tankers.

The new USAF budget will boost total new contract authority for fiscal 1958 air power (USAF and Navy) to more than \$37 billion for 3181 new planes. However, the air power budget again shows a ready need in the executive branch of the government. Factors figuring in reduction in the congressional appropriation are:

• President Truman's stubborn insistence on the 45-group Air Force specified in his budget message of last January just last week the President told aviation men he was ready to stand firm for the 45-group program. Some senators supported the USAF because only because they felt confident the President would refuse to allow the additional funds to be spent.

• The economy program under way in the Defense Department. Defense Secretary Johnson is now in the midst of cutting back fiscal 1958 military spending some \$600 million below the presidentially approved budget. This would mean lopping off about \$1,100,000,000 from the fiscal 1958 budget just approved by Congress. Air Force Secretary W. Stuart Symington insisted during hearings on Capitol Hill that Johnson's cuts were aimed mainly at reducing the armed forces during fiscal 1959 so they would be approaching the level of new inductions already being planned for the fiscal 1951 strategic budget.

Closely the Congress and the executive branch of the government do not see eye to eye on defense problems. For while the President and Johnson are looking every at reduction, the Congress is voting substantial increases for the defense budget. Rep. Carl A. Vinson (D., Ga.) probably the most powerful legislator on the Hill when it comes to defense matters, has enhanced the hearings of the House Armed Services Committee during the past week with his reply reading at Johnson's \$600 million cut already ordered in fiscal 1958 spending. This cut did not come largely at the expense of aircraft procurement for Navy and USAF.

Vinson is determined that Johnson be headed off from an "economy" program that makes reductions in the armed services strength rather than the promised savings through increased efficiency and elimination of surplus aircraft. The increased funds for the USAF approved by both House and Senate now give added impetus to the ongoing clash between Vinson and Johnson when the latter appears before the House Armed Services Committee. For made the Navy USAF funds not modifications over the \$36, the real issue at stake will be whether the Defense Department must spend money appropriated by Congress for purposes for which it was appropriated.

Vinson did his best to emphasize Symington's own open defiance of the presidentially approved 45-group USAF ceiling. Banning Symington with a newspaper comment that Sen. Wayne Morse (D., Ore.) alleged that Symington had told him the USAF did not need the planes, Vinson asked Symington bluntly when he stood at the bar of the USAF. Symington denied the question to Sen. Thomas.

"I have always believed that the strength of the United States demands an Air Force of 70 groups," Symington told Vinson. "The President feels there is not sufficient money to get them at this time. However, he does that he believes we should have 70 groups when the money is available by approving the authorization legislation for the 70 group force. I support the President in that, so we do not have the money for 70 groups at this time but feel we should have them in some in possible."

Symington said that because of the doubling in plane strength of B-52 bomber groups the USAF program now contemplated only 67 groups for maximum practical economy.

The Senate debate on the USAF appropriations reflected little of the basic elements of aviation procurement we even care interested in Capitol Hill and the magnitude of the job of educating legislators on the facts of air power that still needs to be done. For example, Sen. Sargent Shriver (D., Md.), a supporter of the 45-group program, noted that only half of the 454 additional fighters can be purchased as fiscal 1958. He apparently still doesn't realize the three to diverse long lag from placing an aircraft order until delivery to military squadrons. The lists of air power and its industrial problems must be launched into the Hill constantly if these unpredictable annual budget cuts set to be avoided in the future and military air power is finally get the funds it needs at the winter's first line of defense.

Symington pointed that the Russians are three years ahead of their timetable on strategic bomb development. The lesson show that we are already two years behind our time table calling for the development of a 70 group Air Force by 1952.

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## AVIATION CALENDAR

Oct 14-17-CIA Newsweekl D-Day Anniversary Committee meeting, Oklahoma City

Oct 16-17-Air annual San Francisco Air Fair, sponsored by James Chapter of Commer, San Francisco Airport

Oct 20-Nov 1-Annual convention, National Ass'n of State Aviation Officials, New Orleans

Nov 3-4-Second annual Inland Industries meeting, Chase Hotel, St. Louis, Mo.

Nov 9-10-Second annual metal seminar and dinner, Sheraton Inn, Colgate Hall, University Park, St. Paul, Minn.

Nov 9-10-Second annual meeting, Ass'n of Dealers and Manufacturers, French Lock Supply Hotel, French Lock, Ind.

Nov 16-Dec 2-Annual meeting, Society of Experimental Test Analysts, Astoria Hotel, New York, New York

Nov 30-Dec 1-Korean Airport and Aerial Show, Conference Machines, Kusam

Dec 9-11-First Convocable Aircraft Show, sponsored by Philadelphia chapter of IAMS and American Helicopter Society, in Philadelphia

Dec 15-17-National aviation meeting sponsored by the National Aeromodel Ass'n, Washington, D. C.

Jan. 17-Institute of the Aerospace Sciences 19th annual Wright Brothers Lecture, U.S. Chamber of Commerce Building, Washington, D. C.  
Jan. 18-19, 1960—All American Air Shows, Miami

Jan. 18-20-Motor Marine Show, sponsored by American Society of Mechanical Engineers and Society for the Advancement of Management, Cleveland Auditorium, Cleveland

Jan. 23-25 annual House Night shows, Hotel Astor, New York, N. Y.

Jan. 23-26-GAS 12th annual meeting, hotel and museum, Hotel Astor, New York, N. Y.

Feb. 18-20-National Sportsmen Show, Grand Central Palace, New York, N. Y.

Mar. 5-8-17th annual meeting, American Ford Motor Ass'n, Netherlands Plaza Hotel, Cincinnati

Mar. 25-31-National Photo Exposition, sponsored by Society of the Photo Industry, New Fair, Chicago

April 16-20-Annual Indiana meeting, American Ass'n of Airport Executives, Nel Noyse Hotel, Columbus, Ohio

## PICTURE CREDITS

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## NEWS DIGEST

### DOMESTIC

Navy has grounded its two Constellations, speculate saying it costs three to five times to launch in agents the Constellation than the DC-10. Constellation is capable of carrying 180 passengers.

An Reserve Ass'n argued a proposal to merge with the Air Force Ass'n, at its annual meeting in Long Beach, Calif.

Military Air Transport Service has taken delivery of its last new Boeing C-97A Stratofreighter. Boeing also delivered to British Airways Ass'n Corp. its first Stratocruiser. MATS has an order for 30 C-97As. BOAC had an order for two Stratocruisers.

Boeing Aerospace Co. had an 11.8 percent of its Seattle plant, reducing work force to 12,000. The company, which has an NLBIS electron to determine the launching agent for Boeing employees has been set for Nov. 1. Located in the IAM's Ass'n of Machinists union and an affiliate of the Teamsters Union.

Curtiss-Wright Corp.'s engine division, Columbus, will start production immediately in a new \$1.2 million USAF order for U-16 propeller parts. Initial delivery will not be completed until March, 1961. Wright engine division shipped first three production models of Cyclone 57 which has just passed military model tests—use for use in USAF's T-28, and use in Condor transport aircraft, and Alouette. For Nov. 1, an additional 100 units.

James M. Sholeskay, Jr., Glaser-Voight Aircraft's chief engineer since 1941, died at Dallas, Tex., after a long illness.

American Airlines has been instructed to use caution for scheduled operations between Wilcox Raige, Ariz., and Tulsa, Okla., a route that currently has no traffic control facilities.

### INTERNATIONAL

Canadian Pacific Air Lines has started round-trip flying gas to a DC-10 jet service from Montreal to Vladivostok and Rangoon-Normandy where strip landing fields are now being strip planned.

Peter Macmillan, Cunard Britain's first air attaché to the U. S. from June 1945 to September, 1946, has been appointed chief executive of British European Airways Corp. After leaving Washington, Macmillan served as director general of long-haul planning and projects for the British Ministry of Civil Aviation. He then joined BEA as assistant to the chairman.

Two passenger derivatives for Concorde Macmillan de Aviation—Pan Am's Boeing 747 and Pan Am's Boeing 747-200, are expected to be delivered in the fall of 1970 under a CMAA plan (Aviation Week, Oct. 17). They were cleared with commercial regulators in permitting the DC-10 to fly. An allegedly self-imposed ban against over a route that had no radio beacon and used "ground contact" for navigation.

South African Airways has flown 173,380 passengers over 26,381,158 miles in 14 years without a single passenger fatality. This year, 125,000 passengers have already been carried 6,539,916 miles, a considerable increase over the 206,493 miles and 30,550 passengers carried in 1959. South African Central Airways has agreed to do on the Boeing 747 service between the United Kingdom and South Africa.

British Ministry of Civil Aviation said aggregate operating deficit during fiscal year ended Mar. 31 for British Overseas Airways Corp., British South American Airways was reduced by 12.2 percent. Domestic loss was halved by a 52 percent increase in capacity but sales down. Revenue per miles were increased 20 percent.

Transair Europe Airways' Silence IV flying boat set a transatlantic flight record for the English-New Zealand leg, completing the flight in 50 hr., 15 min.

### FINANCIAL

Beech Aircraft Co., board of directors has voted a quarterly dividend of 25 cents per share on its \$9.855 issued and outstanding shares of common stock. Dividend is payable to stockholders of record at the close of business Oct. 26.

Northrop Aircraft Inc., which net freed a net loss of \$1,574,454 for the fiscal year ended July 31, compared with a \$120,146 profit in the previous fiscal year, described the last 12 months as one of the most difficult in its history. Northrop's annual report revealed that the company is recovering from a sharp contraction in production of C-135 aircraft for the U.S. Air Force, an addition of Air Force contracts for 10 RF-4C Phantoms and for 10 AWAC aircraft. C-135 orders increased markedly for 1966 in all areas in a single day.

American Airlines reported net profit after taxes of \$5,915,000 for 1967, up from \$61,416,000 for the prior period last year. Third quarter profit alone was \$2,169,000.



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## WHO'S WHERE

### Changes

James A. Wootton, formerly president of Alaska Airlines, is now chairman of the board of Northwest Air Transport, Inc.—Tom Y. Smith, former general manager of the Fleet Manufacturing Co., Ft. Lee, Ontario, accepted a consultancy at the headquarters of the Fleet of America, Inc., Buffalo, N. Y. Form is assigned as production of aluminum products. Michael E. Cole, Southwest Airways general traffic manager, has resigned to become vice president of Western Air Lines in Las Vegas, Nev.

### Appointments

Ronald G. Colahan, for two years regional personnel manager for Eastern Air Lines at Atlanta, is now employment manager for All American Airlines, Inc., Ft. Lauderdale, Fla. He succeeds C. L. Johnson, who has been promoted to manager of personnel and staff services for American Airlines, replacing H. M. Byrnes, resigned. Ronald S. Cook is manager of public relations for Carter propeller division. Michael J. Phillips is general manager of the newly formed International Division of Carter, Inc., Fort Worth.

John K. Westfall, a research engineer in charge of aircraft anchor strength and aviation department, according W. R. Caldwell, Jr., new manager of research and tests.

Richard T. "Dick" McCleary is a manager in charge of maintenance engineering at the new Northrop Corp.'s Testable Production Division. Franklin A. Matthiell is factory manager of the Edgerton plant in Elgin, Ill., replacing S. E. Hansen, now with Curtiss Wright Corp. in Wood Ridge, N. J.

### Awards, Elections, Honors

George G. Van Nostrand has been elected vice president and general manager of American Airlines de Mexico, succeeding Domingo de Molina, originally appointed as director of operations and president of S. M. S. International Sales & Service, Inc.

John W. Nease of the Boeing Army Organization has been elected a director of Helicopter Air Services, Inc., Seattle. Thomas J. Murphy, manager of General Electric's Aerospace Gas Turbine division at Lynn, Mass., has been appointed to the David Guggenheim Medal Board of Award.

Gordon R. McGregor, president of Trans-Canada Air Lines has been elected chairman of the executive committee of the International Air Transport Assn.—John L. Calfee, president of B. F. Goodrich Co., has been elected a trustee of the Alfred P. Sloan Foundation.

### Leave and Retirement

Joseph T. Crowley, manager of Aircraft Industries Assn.'s Prevalent Aviation Committee, will be on leave from his Washington office for a month or more after a physical checkup required for a medical examination next month. George F. Fox, vice president of the Edie Corp., has retired because of illness.

## INDUSTRY OBSERVER

► Watch for two and possibly three West Coast aircraft manufacturers to announce shortly after or during their respective product shows off the drawing board into their experimental stage. Their manufacturers will go ahead with turboprop transport prototypes regardless of what happens in the prototype legislation now before Congress. At least two of the three firms are expected to take a stand against government financing of conventional transport prototypes, on the grounds that private financing of such projects poses less problem than trying to build planes according to the dictates of the type of aviation policies that might staff a government prototype development board.

► Major airlines are now in the orbit of a trend toward aluminum passenger blades, with the result that Carter Propeller division and Douglas Standard are readjusting a new pack to production of that material. There is a number of reasons, among them the fact that both the blade and CAA's metal fatigue regulations, going back to start after extensive stress tests at completed on hollow steel blades. More use of the hollow steel blades according to CAA, it is a weight-strength ratio that will count heavily in the long run.

► Initial steps are under way to bring aeronautical requirements on aircraft standardization in line with the broad international agreement recently reached between the U.S. and Great Britain. Generally, the aircraft industry feels the international agreement's provisions are too broad for present aircraft work and wants a supplementary pact calling for closer tolerances for special types of threads used in aviation. A new standardization project may be called the result of this supplementary agreement is expected to emerge from the post-wartime-coal aeronautical group.

► Piper Aircraft's new experimental twin-engine all-metal five-place executive transport is a modified version of the West Coast experimental Mexican Brigadier, which Piper has purchased. Piper version will use two 300-hp. engines instead of turbos in tailair position, instead of the two 125-hp. pusher engines used in the original plane. Main changes are in wing position and powerplant installations with new fairings underneath. The Piper Brigadier, which is expected to be reviewed, will probably fly in December.

► Boeing Aircraft Co. closed its Moses Lake AFB flight test operations in Washington with departure of the second XB-47 Strategic bomber fitted with GE J-47 engines. From the field—approximately 48 Boeing employees stationed at Moses Lake were transferred to Wichita, while other experimental division employees were temporarily assigned at Wichita. The project leader flew from Moses Lake to Wichita in a maximum flight of 2 hr., 55 min. for the 1300-mile distance, or at the rate of approximately 600 mph. Pilot was John Pernau and A. M. (Tee) Johnson.

► McDonnell Aircraft Corp. short afterburners have been fitted to the second XP-88 Voodoo jet fighter now at Marine Air Force Base, Calif. As its name implies, this is a very short turbine extension incorporating fuel nozzle. Although its shortness limits its power increase over the two Westinghouse J34 turbojet engine installations, it provides about 20 percent increase thrust for short periods.

► Lt. Col. Marion E. Carl, former world speed record holder, drove a North American F-86 Sabre jet fighter to Mach Number 1.45 recently over Wright-Patterson Air Force Base, Dayton, Ohio. Carl made the flight at the source of a caviton wave to the Air Force installation. Supersonic speed mark was attained in a 35-degree dive, down 45,000 ft. In a vertical dive, the F-86 is capable of Mach 1.275, at slightly less than 550 mph. At 46,000 ft. Air Force has not yet fully explored the transonic speed possibilities of the Sabre due to structural damage to the prototype XP-88 combat aircraft modifications aimed at permitting evaluation of full aerodynamic capabilities of the design.

Oct. 26, 1969



DEDFIELD AND CATES—From left, strength of Navy, Marine and Air Force



SYMINGTON—Counter-attack on power to review



BLANDY—Strategic bombing has its points

## Symington Counter-Attacks the Admirals

**Secretary tells House committee of new anonymous document criticizing USAF.**

Central of the military services by claims is now the fundamental principle at issue before the House Armed Services Committee: investigation of national defense, Air Force Secretary W. Stuart Symington told the group last week. Symington opened a blistering USAF counterattack on previous testimony by Navy admiral Shultz, the B-52, the B-52 bombers and strategic bombing.

The admirals had told the congressional they were unhappy over handling of the Navy by Defense Secretary Louis Johnson. His management orientation, the first Chief of Staff, and the civilian orientation of the Defense Department components. The admirals countered that they were now running Defense. Defense Department documents not qualified to evaluate Naval problems. Symington,

described himself to the committee as just a civilian living in New York City.

► **Used by Retirees?**—The USAF spokesman also charged there was a "disturbing tendency" between the admiral's testimony and the contents of a new memo issued, as USAF strategic bombing chief, to James C. Shulman of the Naval Reserve Bureau. Shulman is a Naval Reserve captain.

► **Used by Retirees?**—The USAF spokesman also charged "The Strategic Bombing Unit" was also used for substantiation of a Naval Reserve group in New York. The House spokesman was asked if an anonymous letter was filed in a USAF strategic bombing unit entitled "The Strategic Bombing Unit." Symington said and read me a letter from Franklin D. O'Brien, head of the U.S. Strategic Bombing Survey to Louis Johnson regarding the anonymous document as a deliberate fabrication aimed at discrediting the conclusions of the survey report.

►

Symington and the anonymous document, the admiral's testimony showed the same principal arguments, and identical qualifications, and some critics made the same misstatements.

Symington denied that he or any

regular Air Force officers favored abolition of Naval aircraft.

► **Navy's Stand**—I believe some of our Air Force secretaries have been advocating a single air force since many Navy aviators have come out for Navy participation in strategic bombing," Symington told the committee. He cited a 1947 speech by Adm. Chester Nimitz reviewing Navy participation in bombing the Japanese homeland in which one of the Navy's intentions is to increase its USAF strategic bombing function.

Symington claimed that more 1947 members of the Naval establishment long been considering a combined organization, able and autonomous campaign against any coalition with long range. He said the Navy had traditionally opposed extension of the range of land-based aircraft and that the proposed move for it would against the B-52 was that the Convair bomber had intercontinental range.

► **Rough Clothes**—To the best of my knowledge nobody has ever tried to limit or control the development of plane or aircraft which carry cargo, equipment," Symington asserted, "but obviously there is a stage in time in range the same limits."

He charged that the "basic and unopposed attack" on the B-52 or any other long range strategic bomber must be considered when military appropriations are about to be determined.

► **Reply to Chieng-Symington**—Answere the following specific charges made by the admiral:

► **USAF is putting off the fight into space battle.** Symington pointed out that the 70 group USAF program involved only four groups of B-52 bombers and had 199 hours of flight time maximum per year, while others had been to combat. The B-52 bombers could not constitute only 5 percent of contemplated USAF strength.

► **Investment in B-52 procurement is slowing after losses of the service for defense appropriations and forcing cutbacks.** Symington pointed out that when the B-52 program was completed its cost would be less than a billion dollars. Cost of the additional B-52 procurement to which Adm. Robert F. Blandy objected amounts to 11 percent of the National Defense Establishment budget of fiscal 1969 through '70, Symington told the committee.

► **Testimony by Adm. Donald** that a high level joint USAF Army and Navy committee appointed to study strategic bombers had concluded that strategic attacks would be sufficient. Symington quoted a letter from Maj. Gen. H. R. Hanson, head of the joint group which stated that the group's report was in accordance with the instructions Donald sought to create. He

men also denied a story by Harmon Hallinan in the N.Y. Times stating that pressure had allegedly been brought on Harmon to submit his vote against strategic bombing. Symington pointed out that Donald had refused to give the committee the conclusion of the Harmon Report on the grounds of source.

► **Testimony by other admirals** that the USAF had purchased additional B-52s through precipitate action that ought to have the Joint Chiefs of Staff and Defense Secretary informed. Symington responded that the Air Force had gone through all of the complicated approval and certification process for aircraft procurement required by the Defense Department and that it took from January to April to wind through the mass of red tape. He pointed out that the Air Force knew the USAF wanted to buy more B-52 bombers.

► **Stability**—Proponents—Symington recommended that the planned posture would proceed for assault by the Defense Department should be maintained and revised to the most simple design possible required for ships and units of other locations.

"Stability would help the Air Force and the aircraft industry," Symington said.

► **Mirage Corps**—Commandant Gen. C. C. Cates told the committee that the Army was trying to stop the Marine Corps in combat readiness and turn it into a police force.

► **Major Reactions**—Major surprise at the Navy's case was the testimony of Adm. Lewis Denfield, chief of naval operations and Navy representative to the Joint Chiefs of Staff. Denfield argued that the House committee's conclusions should be allowed to proceed in accordance with the procedures of the Joint Chiefs of Staff and the Secretary of Defense.

Denfield, who was recently appointed to a second two-year term as chief of naval operations by President Nixon, faced a difficult choice in supporting either the Navy admiral or the civil service to whom he owed his appointment. His opening statement to the committee made clear that choice.

► **Opposes Redding**—To the senior Navy general, the admiral, Denfield said, "I want to tell you, sir, that I fully support the conclusions presented in that memorandum by the Navy and Marine officers who have preceded me."

Denfield, a reformer, reportedly claimed that he is an advocate of an open and balanced view of a new and dominant force in the U.S. military structure. Apparently taking issue with the cabin confirmation of strategic bombing, he Redding and Gen.

Admiral Ralph Olson, Denfield argued. "I am also a proponent of strategic air warfare. It is my deep conviction that the purpose of the war is to affect our predominance by the Strategic Air Command in the next war. Our command in the next war, if we should come, must be directed with full greater precision and intensity than the bombing effort in the last war. Target systems and individual targets must be carefully selected, identified and let lots of accuracy of our orders and we must make the expenditure of resources minimal."

► **Navy's Stand**—Furthermore I argue that the United States Air Force is not solely a function of the U.S. Air Force. The country's total military power is the combined strength of the Air Force, the Navy and the Marine Corps.

Denfield said that procurement of additional Convair B-52 bombers should be postponed until the report on the Strategic Systems Evaluation Board was completed.

"It is alleged, changes and adjustments in present contracts to make procurement and production evaluation to the extent that the Army and Navy may be required to fund and use strategic and tactical aircraft in war without respect to war funds short on war-time wages."

► **Approved B-52 Purchases**—USAF officials testified yesterday that the Air Force planned to buy 17 B-52 bombers at a total cost, including prototype development, of about \$1 billion. Denfield said no service should be allowed to proceed with weapons procurement without JCS approval and advocated he had approved additional USAF B-52 purchases when they were submitted in JCS last April.

Denfield also charged that there is a strong argument within the members of the Defense Department to change the Navy's role in a war and assign carrier serving as the grounds that "any probable enemy pattern with negligible threat strength." Denfield said the Navy needed aircraft primarily to attack submarines. But carrier task forces are necessary to attack submarine bases, shipyards and training areas and therefore must be ready able to blockade submarine as hostile killer groups must find and destroy submarines or one whole patrol group, shipyards and bases are necessary for the main task of attacking submarine.

► **Wants Full Partnership**—Denfield charged the Navy was not being allowed to "full partnership" in the mid-Defence Department and avoided cancellation of the 65,000-ton super carrier to a service in the vote of Army Chief of Staff Gen. Oscar Denfield. Denfield and he received a non-objectionable press release ensuring the supercarrier cancellation by Defense Secretary Leon Johnson only

40 minutes after he signed the report of the JCS endorsing the mission's option on the atomic payout.

Deshler asserted that the "tentative" cut of \$350 million below the Navy's maximum fiscal 1950 budget ordered by the Management Committee headed by Capt. Joseph McNamara was "first" at Sept. 8. Deshler said that Navy had no choice but to make Navy reductions elsewhere. This included the ship building bid already been cut 60 percent and electronic procurement reduced 43 percent. He did not mention that 500 anti-submarine warfare planes had previously been shifted from Naval aviation's budget by the Navy and the Budget Bureau.

► **Cuts for Carrier**—The case for the super-carrier was argued by a galaxy of prominent Naval war veterans including:

\* Admiral William H. P. Blandy, commander of the Atlantic Fleet. Blandy disagreed with both Rad and the CIO that this launching of the effects of carrier aviation in World War II. Blandy said the U.S. strategic bombing survey report clearly that that force of aircraft had a very great effect on Germany's oil and steel industries, and her transportation plus a marked effect on her general industrial economy and the morale of her people.

Blandy said, however, that British "area bombing" by night was "quite an effort" and that no strategic bombing was effective until long-range carpet bombing and very large numbers of bombers were available.

\* New Adm. Louis De Flous, in service spokesman in synthetic training devices and research problems. De Flous maintained that development of the super-carrier is necessary to be held continually against the character of future warfare. He said the vulnerability of the carrier force has greatly increased and is not being met by the Pacific war record.

"The carrier has outgrown also



THUNDERJET GARRLANDED WITH ROCKETS

The six multi-turbine engine aircraft of Aviacon F-86s, mostly released in a four-camera version of the Republic F-84E, performing as a fighter-bomber. In addition to its standard armament of six M-32 20-mm. guns,

the plane carries 12 HVAR rockets, each weighing 140 lb. Alternative armament can carry 160 lb. Altitude endurance can be 34,000 ft gross weight. F-84E power is supplied by an Allison J35-17 jet engine rated at about 5800 lb. thrust.

lets like the battleship whose gun base has been damaged by the striking power of ground伏击. De Flous asserted "we will not be easier before objectives are placed on our back base because absolute obsolescence."

► **Urges Test**—De Flous urged a test and evaluation of the B-56 in terms of its potential opposition by means of a joint committee between Strategic Air Command and the Navy. He said that a prolonged program of this kind would be beyond the horizon. He replied it and that the best Naval studies agree that a solution has arrived. It "should not be centralized nor its development stalled."

\* Admiral Richard L. Gresswell, commander of the Eastern Atlantic and Mediterranean Air Task Force. Gresswell said that initial requirements of our European allies in event of war could easily be supplied by aircraft carriers and naval forces. Early fighting in Europe would require many times the carrier and carrier forces provided in the present plan.

General Clegg told the committee that U.S. Naval requirements in the East Asian and Mediterranean are mounting due to the strength of overall British naval strength and that unless strong U.S. forces were available for immediate deployment there, our military operations and those of allies "would be hamstrung."

\* Rear Adm. Louis De Flous, in service spokesman in synthetic training devices and research problems. De Flous maintained that development of the super-carrier is necessary to be held continually against the character of future warfare.

He said the vulnerability of the carrier force has greatly increased and is not being met by the Pacific war record.

"The carrier has outgrown also

they can deliver 25 times the weight at loads on a target possible through use of land-based conventional bombers in any given length of time, according to Thach. He added a last month task force was not a profitable target for strategic air attack.

## Bell Strike Ends

### Aleco Strike Effect On Aircraft Slight

Strike of 600 workers against Aleco Aircraft Company of America has cost 50 percent of Aleco's production and 25 percent of the nation's total output. But the shutdown is still essential for the aircraft industry and will not be for some time.

Aleco has a sensible stock of sheet metal sheet and aircraft and large quantities of ingots. In general, aircraft manufacturers who have substantial inventories of sheet

► **No Immediate Push**—The plant builders are well aware of standard aircraft. We see that there won't be any pitch for several years—and even then only on a few basis.

Aleco's Lockheed, Boeing, and other important products of aluminum extrusions has not been struck. This plant has more capacity than it has been utilizing.

New Plant Ready—Also not struck are the Cleveland, Garwood, N. J., and Vernon, Calif., plants where aircraft forgings and aircraft structural components are also being produced, says a New Kensington, Pa., and Akron Team. These have shut down by the area that covers the company has a broad new sheet plant at Duncannon, Pa., which has never been run at full capacity because of its difficult nature.

If Aleco can't satisfy its current demands through its stockpile, aircraft customers may turn to its competitor—Kaiser and Reynolds.

► **Strike Issues**—Incomes in the Akron strike are those.

The company has a pension plan and benefit programs in which employees do not contribute. Pensions cost the firm 5 cents an hour and insurance 2 cents an hour. Aleco has offered to increase these figures to 6 cents and 4 cents, respectively, and to pay the entire cost of pensions and insurance as recommended by the President's Steel Board.

However, the company stated that pension and insurance are subject to adjustment later on the basis of any changes in the social security laws affecting these benefits which the employee receives from the government.

The union has refused to tie the strings to the gunpowder. Also, it contends the union's position deviates from the general ad. before the Steel Board. CID President Philip Murray claims Aleco's proposal would result in a reduction of the company's pension payments.

local staff, instead of under the regional administrators as has been the case. It is believed that the union complete control will be chosen as early as October, the time big which would constitute between regional and Washington offices of the mid-way would not affect.

Most will not entail a large shift numerically in CAA personnel. Recent migrations from the regional technical staffs have cut the number to be moved in a total of five persons from both regions.

► **Single Standard**—Importance of the shift in the current mobility however is far out of proportion to the size of the personnel losses. It will impact the first time in five years on certain positions and might standardize the regional and Washington and a single centralized incorporation of certifications.

Representation from the Washington office can be sent out overnight to any agency or propeller plant in the country, and will have full authority to make quick decisions, which previously have been delayed until the regional offices could get Washington authorizations. Results will be in many savings of several days' time.

► **Pilot Defenders**—Still more important however will be the elimination of differences in policies between regions and the Washington office. These have been the cause of much friction and a number of strained operational skills.

Typical of such difficulties was a recent case involving the continued time required for a certain propeller. Region 8, which has never certified sit one over two week interval, while other regions in which it was used and the Washington office made another certifying needed four weeks.

► **Union Divided**—While there has



BEFORE FIRST FLIGHT

Close Assault Co.'s XG-12 is shown as it prepared to take to the air for its first flight. The large and cargo carrier is powered by two Pratt & Whitney R-4360 engines. It is estimated to have a top speed of over 250 mph and a ceiling speed of 300 mph. Close estimates the XG-12 can carry a useful load much greater than its empty weight of 25,000 lb. Severe icing is calculated at 15,000 ft, range 150 mi.

have some industry split hairs for a few months before aircraft certificates have procedures in Washington from the regional offices, again a state divided in its desire to fit into either. Another CAA study is expected to be made on this matter.

It is understood that West Coast traffic controllers are not dissatisfied with the present regional office air traffic controllers and might prefer it to a continuation in Washington. Several persons outside manufacturers however have expressed a desire for centralization of aircraft certification.



DANSON in Ambassador's cockpit seat

## Buying British?

TWA president sees future U. S. market for England's new planes.

The appearance of new British transports at the recent Farnborough show continues to get rave notices from U. S. airline officials, but second thoughts on the part of both sides to U. S. market are increasing.

U. S. president Robert Bowen, returning from Europe last week, told a New York news conference that he had seen first of Britain's prime stable of transports—the Handley Page, the British Airways, the Aeroplane & Armament and the Vickers Viscount—and had flown in the last two. He found them "very impressive."

But like Eastern Airlines' Capt. Eddie Rockefeller (page 31), he does not think they will sell in the U. S. despite the price advantage stemming from devaluation, because:

- Lack of availability. British European Airways, which has ordered both the Ambassador and the Viscount, is being quoted a delivery date of 1961 for the

Ambassador, and 1962 for the Viscount.

- Maintenance problems. British maintenance units are different and stocking spares would be a terrific headache.

There is also the matter of different tolerances for materials and different standards.

- High fuel consumption of jets. Danson says his own side got 40 mpg in fuel economy figures that fit in any scheme of economy. He noted across the Channel in flight because it was planned while de Havilland was checking fuel flow patterns in the hope of finding why fuel consumption has seemed so high.

- No marked superiority over U. S. transport types. Danson told American Ward that he was impressed by the British planes but was hopeless they were the best British planes he could bring along for east coast aeronautical review committee.

- Poorly marketed. Now does the TWA boss see a British transport as the Ambassador will be another competitor with U. S. aircraft in the post war market? The Ambassador, for instance, is normally a 40 passenger, four engine high wing passenger monoplane. With that capacity, he thinks the shortage of dollar planes it might be expected to eat into the Convair-Latin American market.

Danson doesn't think it will enough for the reason. It has big and long-range traffic too small for TWA, for instance planes to just about 40 seats, as the Ambassador. However, from Danson's stand point is that traffic potential in Latin America is not likely to be enough to fill that many seats.

- Poor Test Lab—Danson spent 21 days in European and Near East countries. He found economic conditions rather than anything everywhere except possibly in France. The cost does, however, well for TWA's 1958 "Holy Year" plans for boosting traffic across the Atlantic to Rome. The Italian government has launched a massive program that will make about \$3,000 available to airlines, and has promised to keep levies and other grants down. In addition, the U. S. has made living and traveling in Europe cheaper for American tourists.

- TWA is expanding both its domestic and int'l fleet to harvest the Latin Yank traffic. This will be four trips a week to Mexico. The 20 new Convairs have bought flat delivery next year will add 100 seats, making it capable for TWA to carry 9,000 passengers to Europe next year.

- Standard Capacities—In addition TWA is launching a research program to increase and standardize the seating capacities of its present 15 plane Convair fleet.

Twenty-four Model 349 Convairs now used on domestic transcont-

inent schedules will have their passenger capacity increased from 50 to 57. The model 349 Constellation on international service will be redesigned to carry instead of 40 passengers.

The 20 new Convairs will carry 49 passengers. When the 12 Convair 8s currently on international routes are transferred to domestic schedules late in 1959 these aircraft will be redesignated to hold 57 passengers.

- Modification Additions—Additions will be made by relocating coat racks and adding more emergency webbings. These wrinkles will be created in the cabin to provide visibility from the added seats.

Work will be done at TWA's maintenance and overhaul base at Kansas City.

## Flight Safety Group Makes Four Awards

Four awards for outstanding contributions to the field of flying safety were presented in New York last week by the Flight Safety Foundation to Hugh De Haven, research associate at Cornell University; Dr. Leonard Green, president of Safe Flight Instrument Co.; United Air Lines, and American Airlines.

The awards to be sponsored each year in AVIATION WEEK were made in each case in recognition of an outstanding service which had clearly demonstrated its value in achieving safety throughout the world.

- Hugh De Haven, member of the Cornell University Committee for the Air Safety Review for the study of aircraft design principles which will determine the site of fatalities in accidents.
- Dr. Leonard Green, president of Safe Flight Instrument Co. As developer of a successful still steering indicator, "safe" recognized and adopted by the aviation industry to reduce the accident potential of the unsteered still."

- United Air Lines, for the promptness, production and management with the U. S. Coast Guard and California to allow launching of round bottom portables having to do with aircraft in overwater flights.

- American Airlines for participation production and utilization in developing of the sound film "This Was One," a motion picture which shows the most efficient procedures to be taken by crew members to assure passenger safety in the event of an emergency occurring in flight.

Selection of recipients was made by the Flight Safety Foundation, in collaboration with the National Safety Council, the Aircraft Owners and Pilots Association, and the director of the Institute of the Aerospace Sciences.

## Air Races May Stay in Cleveland

Here is how the final 1950 air power budget, described on page 7, stands as updated by Congress:

	New Contract	New Plans	Airtime	Weight Obligations*	Total New
(billions)	(billions)	(billions)	(billions)	(billions)	(billions)
USAF	\$1,993	2158	\$2	56.0	
Navy	857	845	9	4.6	
	<b>\$2,859</b>	<b>3003</b>	<b>41</b>	<b>\$60.6</b>	

\* Including procurement funds and other major items of the new USAF budget, including \$1,180,000,000 cash for acquisition of previous contract authority; \$216,000 for research and development; \$50,000,000 for radar warning network; \$1,145,000,000 for maintenance and operations; \$1,301,000,000 for military personnel; \$55,057,000 for administrative salaries and expenses; \$77,036,000 for USAF reserve, and \$14,680,000 for Air National Guard.

- Rating altitude at which rates are slow.

- Rejection of closed course to entire military aircraft category.

- Adoption of safety equipment to be worn by pilots.

- Extension of present medical pilot requirements.

- It is understood that changes affecting C-40 may be made compulsory for the high speed crews.

- Goodwill Missions—Revision of the 1950 Congressional budget cost report has been recommended and is expected to be adopted.

One revision requires that all planes owned now have 100 percent dryweight officially balanced sections. This will cause modification of the two Wittman Spec

aircraft which took first and third place in the 1949 race but which did not have the balanced sections. The 1949 rates and weights should be balanced, but old rates and weights should not be used.

It is recommended that the aircraft weight limit be reasonably available types or positive including triplane, thereby eliminating the sloped tail rigs now developed by Tony LeVier for his Cosmic Wind men but which he will be forced to drop from the 1949 race after protests of other pilots.

Promised by other pilots against the Wittman planes with withdrawals just before the race, it was pointed out that Wittman had not learned of the "should have" provisions until he arrived at Cleveland.



LOCKHEED'S AIR DESTROYER

First flight was of the Lockheed XP-80, experimental supersonic jet fighter, with wing tip tanks set down which help to give the Lockheed fighter its unusually long range for a jet plane. Powered by two Westinghouse J34 turboprops, and flying when built, the XP-80 has now made more than 25 successful flights and has exceeded Mach 1 (AVIATION WEEK, Oct. 20).

## FINANCIAL

### McDonnell Profits Over War Peak

Company net earnings for fiscal 1949 are reported as \$1,731,832. Backlog is over \$84 million.

McDonnell Aircraft Corp.'s report for the fiscal year ending June 30, 1949, showed the company had achieved the unique distinction of being the only aircraft builder to have reported wartime sales and net earnings for the past period.

The record, accomplished without benefit of congressional orders, is another reflection of the ability to attain satisfactory profits on military work.

For the fiscal year ended June 30, 1949, McDonnell Aircraft showed net sales of \$12,685,384. Adding working progress to the value of completed products, world-wide sales increased to \$13,871,311. During the war period, the company's backlog of contracts had totalled \$21,701,225. For 1949, sales revenues initially totalled at \$10.7 million but dropped sharply to about \$6.6 million by July 30, as purchase requirements were being effected. A steady improvement in sales during 1947 with totals reaching \$11.7 million. Sales were almost double for 1948 with billings of \$13.7 million.

► **Profit Margin.** For the most recent fiscal year, McDonnell showed net earnings, after all charges and taxes, of \$1,731,832, equivalent to 27.47 per cent of sales. This compares with 27.42 per cent in 1948. But company performance during the one year war was far from the twelve months ended June 15, 1946, when net profits of \$587,487 were recorded. This was followed by a net loss of \$12,017,177 in 1946. Subsequent operations assumed an accelerated profitable trend with net earnings of \$580,870 in 1947, more than tripled to \$1,675,327 in the following year.

► **Exclusively Military Business.**—McDonnell Aircraft was incorporated in July, 1938 with two employees and no orders. After accumulating \$1,99,495 in cash capital and employing 15 engineering employees, the company received its first contract, July 1943. The Army Air Forces awarded it \$18,000 worth of parts and supplies during subsidized construction. The company has never deviated from confining its activities to military parts and subcontractors.

During its first ten years McDonnell has produced more than \$115 million

of work, all for the U.S. Government.

► **Financing.**—Planned Back—The company's capital structure developed as follows: At first earnings and a corresponding increase in the autoparts. On June 30, 1948, the total capitalization consisted of \$6,315,000 of common stock and 220,647 shares of preferred stock. The net worth was listed at \$122,390.

Ten years later, the enterprise had a net worth of more than \$5.2 million. The most recent capital situation consisted of 27,342 shares of common stock, par value \$1 per share, and \$154,000 of convertible preferred stock with a par value of \$100 per share.

A research analysis reveals that more than \$4 million of the company's net worth was contributed by joint customers. In other words, during the post-war days while additional shares were sold to provide needed working capital, such a significant financing is estimated to have segregated less than \$7 million.

Nevertheless, the investment in this enterprise during its formative years represented a minimum risk with little assurance that profitable results would ensue. This was venture capital in its most traditional role. In this instance, the original spokesman of the enterprise have been the firm of the well-known investment and hedge fund managers—

► **Share Conversion.**—McDonnell's first capitalization may subject to some dilution in the immediate future. The \$254 shares of preferred stock are convertible into common at the rate of 10 shares of common for each share of preferred. While the preferred currently pays a noncumulative 4 percent dividend in contrast to no dividends on the common, the conversion process has been underway since 1946. As of October there were 10,000 shares of preferred stock outstanding, before conversion into common was made.

Should the company be placed under a divident paying basis and should such arrangements exceed 40 cents per share, there is an incentive to convert. It would become immediately advantageous for the preferred shareholders to convert into the common. It is more probable, however, that the management's preference is for common to be issued in a sufficient quantity to offset the conversion.

—Sieg Altschul

\$105 per share. With the conversion currently selling around \$30 per share, it is obvious that the preferred stockholders would elect to convert these holdings into common and assume the marketable value of about \$700 per share, thus the total additional of \$100 per each share of preferred held.

Each further dilution of the common stock would occur upon the exercise of purchase warrants at \$10 per share on 76,973 shares of common. The bulk of these warrants are held by J. S. McDonnell, founder and president.

In the event of complete conversion of the preferred and the exercise of all outstanding warrants, the present outstanding common shares would be increased wäre 93 percent to bring the total common shares to 398,397.

It is obvious that in this dilution process, the book value of \$70.70 per common share as of June 30, 1949, would be materially reduced.

The company's financial position reflects the excellent performance in aircraft manufacturing. As of June 30, 1949, the working capital was in excess of \$4.1 million, representing a 30 per cent cash only \$38,413 existing in the same category as of June 30, 1948.

► **Property Costs.**—Locating the main plant facility at Lambertville, New Jersey, McDonnell has been able to avoid extensive property commitments.

Current indications point to a relatively high continuing rate of production for the fiscal year to end June 30, 1950 and perhaps for the immediate post-battle period. As of June 30, 1949, the company's backlog was reported at \$61,396,041. The recent report noted that as of September 23, 1949 the backlog was \$100 million.

► **New Orders.**—Mass production for McDonnell in recent months has centered around the B-47 delivery to the Navy. That procurement is divided between two contracts, one for 56 FB-11s for which deliveries were started in August, 1948 and completed about mid-1949, and the second for 179 FB-11s. The last of that latter unit was flown in August, 1949 with delivery completion scheduled by January, 1951. In September, 1949, the company received a contract for additional FB-11 bombers, of which some are night fighters and other photo-reconnaissance planes.

The McDonnell management takes a fairly optimistic view of the future with the assertion that its present backlog will not be completed until December, 1951. Further, it expects a normal follow-up business in engine powerplants contracts, plus a normal amount of production work from present equipment contracts to result in a sufficient continuation of business.

—Sieg Altschul

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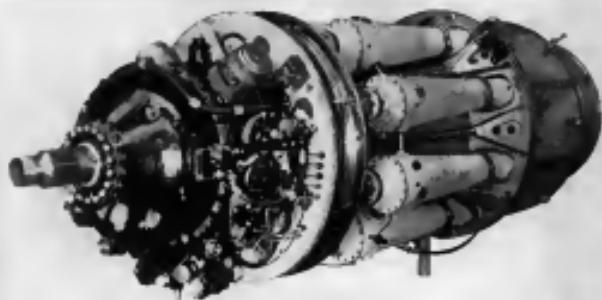


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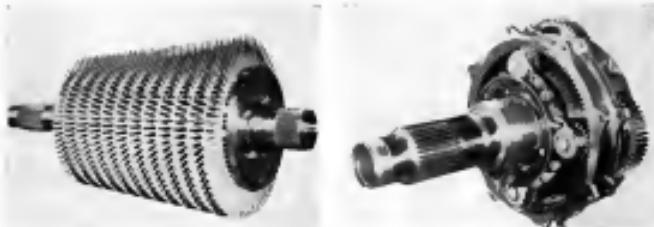
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## AERONAUTICAL ENGINEERING



Proteus' intake is at rear. Flex armoured bellows through compressor to rear through combustion chamber reduces engine length.



Compressor stage (left) has del. malleable, rock duct supporting single rotor stage. Reduction gear (right) is composed epicyclic train.

## Analyzing the Bristol Proteus Turboprop

Engine uses "free turbine" arrangement. Will power  
Bristolian 2, Type 175 liner. Princess flying boat.

Details of the Bristol Proteus turbo prop-Bristol's second largest-horsepower aircraft engine by far the most powerful British turboprop with more power than Armstrong Siddeley's Python.

Advanced and especially suitable for broad applications, the Proteus is designed for economy within the 300-400-hp range at 60,000 to 48,000 ft. It is a good example of British progress

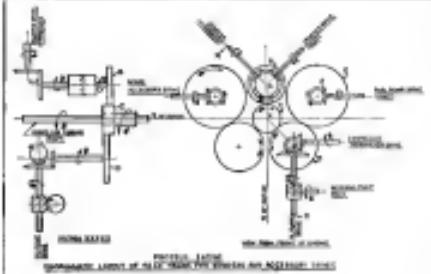
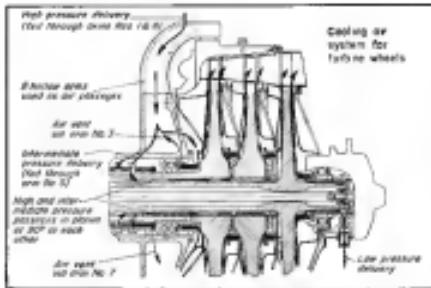
with the type of engine, which undoubtedly think will have wide application in the transoceanic field.

At sea level static conditions, maximum power developed is 3300 pounds thrust at 10,000 ft. At 35,000 ft, 3300 lb. and 330 rpm, the engine develops 1350 lbs. plus 160 lb. per thou.

Specific fuel consumption at sea level is .688 lb./hp hr. At 35,000 ft. (350 mph.) it is 51.8 lb./hp hr./hr.

The Proteus is rated for use in the 110-ton Bristol Type 2, 140-ton Saunders-Roe Princess flying boat, and later models of the Bristol Type 175 four-engine, medium-range airliner. For the 175, company estimates indicate that the Proteus will give the craft a crossing speed of at least 75 mph faster than at the Constellation.

In both the Proteus 2 and the Saunders-Roe Princess, eight of the engines will be used in two separate pairs in each wing to drive contrarotating props. In addition, the Princess will carry a single unit on each wing.



### Bristol Proteus

Ducted Length (excluding gun, gun pipe, receiver)	113 ft
Overall diameter	28 in.
Basic weight	7900 lb.
Propeller rotation	1310 r.p.m.
Propeller shaft rate	5.8 R.P.M. Standard No. 6
Chassis air load static	1200 lb. + 500 lb. Hermet
Chassis air load dynamic	1200 lb. + 500 lb. Hermet
Specific fuel consumption	lb/Hr. lb. dry wt.
Sea level static	8.510 lb. dry wt.
at 50,000 ft., 100 r.p.m.	8.510 lb. dry wt.
Compressor rpm	10,000
Propeller surface rpm	11,000

► **General.** Operation—Air enters the unit at the rear of the compressor, led to be ducted to a plenum chamber. It passes through the axial compressor before entering a single centrifugal stage.

► **The centrifugal compressor.** The air flows into combustion chambers. It

is then turned 90° clockwise around the compressor case, then passes through the axial compressor (250°) on duct 1. A second duct of similar size flows forward through the compressor to turn around through the combustion chambers (about 200°). The last gases then pass through ducts in the

rest of the turbine section. A feature of the Proteus is the mechanical separation of the compressor and propeller turbines ("free turbine" arrangement). This is intended to simplify the propeller system and permit use of a much smaller shaft motor.

There twelve stages are used to absorb energy from the gases. First two stages are coupled and provide the power required to drive the compressor.

► **The third stage.** Turbine is coupled to a shaft passing through the compressor to drive the propeller via an epicyclic reduction gear.

After leaving the turbine, the gases pass in a controllable nozzle sonic throat, maximum energy potential still being in the engine thrust.

► **Compressor.** High compression ratio is achieved via a 12 stage and centrifugal fan followed by a single axial-flow stage, and rotating at a maximum design speed of 10,000 rpm.

Because of the high rotational speed, compressor rotor is of disk construction. Each of the 12 disks supports a single rotor stage. At either end they are fitted to hollow steel shafts, the entire assembly being held together by 4 long, high-tensile bolts passing through the 12 stages.

These bolts are subjected to shear stress since the torque is transmitted from one disk to the next via dovetail fits at each end.

Compressor blades are low carbon, high speed nitro-moly. Disk and blades are light alloy and the latter are enclosed. Rotor blades have "fir tree" slots. Oil and seal glands are in the sides, and are kept at correct spacing by distance pieces. Water blade fit into an enclosed housing of dovetail sections so that the compressor casing can be held in position by four sets of nuts.

Holes between the rows of rotor blades permit air bleeding at certain stages for cooling purposes. Compressor casing is held in halves bolted together.

► **Leaving the axial compressor,** air passes through an annular duct in the intermediate case before it enters the centrifugal stage. Eight guide vanes in the duct hold the outer suction housing two ball bearings which support the front end of the compressor shaft.

Because of the temperature rise in the axial compressor under maximum rpm conditions, and the high rotational speeds, the propeller shaft is enclosed in a housing of solid steel. It carries a short shaft bearing or a roller bearing and is fitted on either side by labyrinth seals to prevent air passing to the intermediate casing or the next engine.

► **Combustion Chambers.** These are somewhat larger than in previous designs to allow the hot gases to thoroughly mix and at an even tem-

perature.

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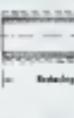


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center section carrying right flap. Outer sections are to be trapezoidal in the outboard section and have full, leading-edge flap and fairing-tail surfaces.

• Conventional tail assembly will have fabric-covered control surfaces with envelope from fairing, elevator.

- Big type, 75 gal fuel tank with self-venting housing pump will be housed in the center section. A fixed belly fuel tank which feeds directly into outer tank can be attached to underside of center section.

- Non-cylindrical, Wasp Jr. engine will be highly conceivable with 10 gal oil tank, faculty mounted on center and other sections at mainplane bearing area so that the oil will be cooled through cooling which is conveniently brought at the firewall.

- Fixed landing gear is to have long stroke, oleo-pneumatic struts and hydraulics, single disc brakes. Premiums have seats in the center section for installation of retractable gear if required. Tail wheel is to be coupled to rudder controls but may be disconnected to freely rotate by raising the tail truck forward.

- Available specifications on the new frame are: Span, 35 ft 9 in.; length, 28 ft 10 in.; height, 11 ft 3 in.; wing loading, 33 lb/ft<sup>2</sup>; weight, total, 10 ft. maximum gross weight, 3680 lb.; wing loading, 147 lb/ft<sup>2</sup>; max. power loading at takeoff, 8.3 lb/lb-hr; takeoff power at sea level, 465 hp; @ 2300 rpm, maximum takeoff power at 5000 ft, 385 hp; @ 2000 rpm.

## Firestone Produces Rubber for Arctic

Development of a synthetic rubber polymer that will burn instead of melting at -71 F. has been announced by Firestone Tire and Rubber Co., Akron, Ohio.

The ability of the new rubber to remain coherent at low temperatures may help solve many problems connected with operation of machinery, motor vehicles and aircraft in Arctic regions, according to the company. It points out that rubber tires lose grip and rolling properties have frozen hard in tests at -60 F.

Tests made with the new polymer rubber, however, do not suffice to determine precisely fire temperatures when probe and probe dash handles and clip not even at -71 F.

Firestone's research staff has been conducting resilience, elasticity, flex fatigue and linkage tests on various types of Arctic rubbers under contract with the U.S. Army's Ordnance Department. Additional research and test programs are being made in collaboration with the Office of Rubber Reserve.

## Evaluation of New Stiffener Form

Curved web Y-action configuration evolved as high efficiency panel member in series of NACA tests.

By Robert McLaren\*

It has long been held that there are two possible ways to an airplane's geometry: shape of its vertical tail surface and the stiffness form used in its structure.

These two design factors have differentiated most of the airplane products by companies; design groups of one individual dominate the world over and suggest that they are selected by individual preference, even though weight technical reports can be produced just as well.

Others believe these forces had a substantial effect on the performance of the airplane on which they operated in a point that may be long denied, but the fact is becoming increasingly clear that stability and safety have lost their grip on the Preliminary Design Group in front of mathematically derived curves and shapes.

This change marks the passing of the old-time "designs" of twisted stiffened rectangular and in-plane frames as now butts of specialists calculating modes and safety, that perform the function complete and manifold functions now in the design of a modern airplane.

And this common switchback is "most efficient-the-easiest" for it is the degree to which they approach the goal that determines the success or failure of the design.

► Efficiency Considerations.—Most efficient structures\* have been a design goal since the advent of sheet skin construction but it has always suffered from a wide variety of definitions that cast its reported value as an order of magnitude.

One measure of the different aircraft structures is the ratio of "present structural weight" (in grams) to monolithic aluminum weight taken at various times as design load factors, allowable stresses used and a variety of such factors as maintenance, production costs, etc.

Although the familiar strength/weight ratio is not a wholly satisfactory criterion for comparison of various structural configurations, it has gained wide usage because of its simplicity.

One of the basic problems in aircraft structures is the design of wing compression parts of minimum weight. Obviously, the higher the wing loading, the lighter the weight of the structure. Working stresses are determined by the distribution of air load between skin and stiffeners, and

of stronger panel efficiency.

By comparing values of this coefficient for several stronger shapes, the next logical design might be readily determined.

It follows from the preceding equations that the coefficient  $\beta$  has its highest value when the coupling stress and the ratios of greatest of the strengths are highest and when the largest spacing is least.

The stronger must have both high ultimate strength and high load-bearing strength and these requirements immediately suggest a modification in the shape of a "Y" or "Z" as shown in Fig. 1.

► Strength Comparison.—To determine the relative efficiency of the two forms, the National Advisory Committee for Aeronautics has conducted a series of tests in panels made up of six stiffeners and five bays spaced evenly along a hydraulic testing machine.

Results of these studies in both 245-T and 758-T showed a 10% gain in efficiency for the Y-shaped panels. Likewise, a more effective method of comparison of the two stiffener forms in the design of two panels to meet the same conditions that promote consideration of such factors as number of stiffeners, width required for the stiffeners and the distance from the midline to the axis of the centerstring of the panel.

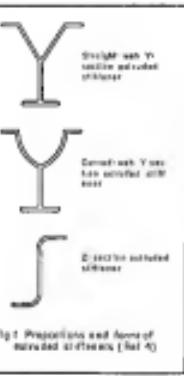
A series of tests was carried out in the manner and method that the Y-shaped panel produced higher average stresses at bays than did the Z-shaped panel, indicating that less weight would be required for the former panel, as shown in Fig. 2. However, the latter requires more space around the wing and closer span spacing.

During the course of the tests, several general trends were evidenced by the designs. For given values of load per unit of panel width and the panel aspect ratio  $L/W$  (in which  $L$  is length of panel and  $W$  is width of panel), a weight of the panel generally increases with an increase in sheet thickness, but the lighter panel is often obtained not at the thinnest sheet gauge at which a design can be achieved but with the sheet one or two gauges thicker than the minimum.

► Stress for local buckling of the sheet generally decreases with an increase in sheet thickness, but the maximum value of the stress for local buckling of the sheet is often observed not at the thinnest sheet gauge at which a design can be achieved but with the sheet one or two gauges thicker than the minimum.

► Stress for local buckling of the sheet generally decreases with an increase in sheet thickness, but the maximum value of the stress for local buckling of the sheet is often observed not at the thinnest sheet gauge at which a design can be achieved but with the sheet one or two gauges thicker than the minimum.

► Average spacing of stiffener flanges is greater (lower ratio required) with an



increase in sheet thickness.

- Distance from the mid-line to the axis of the panel's C.G., decreases in which tends to decrease the effective area of the panel to resist bending of the wing, generally decreases with an increase in sheet thickness.

For given values of load per unit of panel width and sheet thickness:

- Weight of panel increases with an increase in the value of  $L/\sqrt{c}$ .
- Stress for local buckling of the sheet generally decreases with an increase in the value of  $L/\sqrt{c}$ , except at the heavy sheet thicknesses.

**Height of the stiffener**: increases with an increase in the value of  $L/\sqrt{c}$ .  
**Stringer spacing**: of root has greater influence with an increase in the value of  $L/\sqrt{c}$ , except at the heavy sheet thicknesses.  
Distance from the mid-line to the axis of the panel's C.G., generally increases with an increase in the value of  $L/\sqrt{c}$ .

**Ridge of position**: increases with an increase in the value of  $L/\sqrt{c}$ , but this does not necessarily increase the effectiveness of the panel to resist local loadings.

**Cantilever Effect-Case**: of the way in which the local buckling strength of the Y-section form might be improved even further is by use of cantilever in the webs of the section. To investigate this possibility, the NACA tested 48 panels having curved web Y-section stiffeners. The panel and method of test were identical to those used in Fig. 5.

These tests showed the curved-web sections had higher strength than did those that did not accompanying straight web Y-section panels.

Because there are two structural failure requirements for panel stiffness, webs, high enough strength and high local buckling strength, the tests were divided further into two sets of panels, one set of which showed that failure is primarily by column bending, and a second set of shorter length such that failure would be, at least in part, associated with local buckling.

Carrying of the webs of the Y-form of reference 48 material into the axis of the C.G., thereby decreasing the efficiency of the panel in column bending, at the same time increasing its efficiency from the stand-point of local buckling. Hence, it was determined that web curvature can be expected to have either an adverse or beneficial effect upon the structural efficiency depending upon the length of the panel in which the stiffness is used.

Results of the tests confirmed these conclusions and showed that in the high stiffness region in which failure is at least in part associated with local

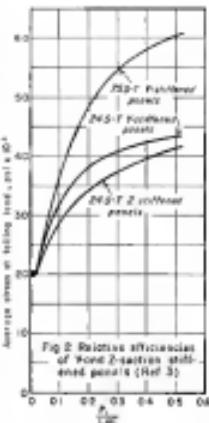


Fig. 2: Relative efficiencies of three 2-section stiffened panels (Ref. 2).

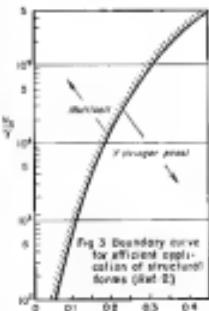


Fig. 3: Boundary curve for efficient application of structural forces (Ref. 2).

buckling, panels having curved-web Y-sections have higher structural efficiencies than plain webs having straight web Y-sections.

These higher structural efficiencies were realized by higher efficiencies at failure, smaller stiffness lengths, or wider stringer spacing of root loads, or strain concentrations depending on the design requirements.

**Application Range-Having deter-**

mined the most efficient compression panel designs, it is of interest to consider the possible limits of range of application of stringer-stiffened panels.

The combination of increasing load and size decreases wing thickness, appears from high-speed aircraft data, toward panel loads which eliminate all stresses in favor of total web. The question now is: can one to structure requires is the exact combination of these factors at which this transition should occur, while maintaining minimum weight design?

A study of this problem develops the following equation:  $N_{\text{eff}} = \pi^2 E / (x + y)$  where  $x$  and  $y$  are couples as pressure multiplied base after they are factored both as functions of the geometry of the structure.

A plot of this expression for various values of wing thickness/structural chord length is shown in Fig. 3 and establishes at least a tentative parameter for the determination of the boundaries of the problem.

It will be noted that since both  $x$  and  $y$  are terms of the sixth order, slight changes in either will profoundly affect the location of the boundary curve. The stronger panel efficiency term,  $x$ , varies directly with stiffness, and optimum panel dimensions are such that it is apparent that any deviation from the ideal combination of stiffness, spacing, web pitch, sheet gauge, etc., would shift the boundary curve considerably.

Similarly, the  $y$  term is a function of the number of webs and structural chord height ratio, variation in which would produce substantial variations in the position of the boundary curve.

However, Fig. 3 indicates clearly that the stronger panel form is the most efficient up to very high loadings at very low web thicknesses and that a wide range of application of the curved web Y-section form exists.

But it should be emphasized that the foregoing has been computed primarily with minimum weight design and that many structural designs can be determined on the basis of a variety of other primary considerations with minimum weight only of secondary importance.

Manufacturing considerations may require increases in web pitch and/or stringer spacing, a decrease in the size of web width, etc.

Anisotropy considerations may also be extremely disastrous, and non-elastic contributions may demand greater buckling stiffness than that usually present in the structure.

Such deeper will require modification

of these data presented here, but their availability will permit the designer to "lean towards" the minimum weight relationship, resulting in a more efficient structure than would otherwise be obtained.

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## Material Developed For Jet, Rocket Use

A metalic compound for jet and rocket nozzles, reportedly capable of withstanding temperatures up to 3000 F, has been developed by American Metal Corp., Easton, N.Y., for the Navy.

Holding unexcelled higher temperature than any other solid solution to 10 cent tests in the Navy, the new compound may prove to be far superior to the dubious problems of finding nozzles strong enough to stand up in the intense heat generated by turbine and rocket powerplants.

The compound contains manganous and barium, and the Navy is planning further extensive test for it. It is proven capable of withstandng high operating temperatures while simultaneously holding stresses of 10,000 to 13,000 psi, considerably above those of 10,000 to 12,000 psi shown by the best materials to be derived through use of typical composition ratios and maximum heat release can be practically applied.

## "Noiseless" Room

An anechoic (no echo) chamber that provides absolute silence has been developed by engineers of the Avco-Signal Corp., Woburn, Mass., which will make it possible to determine the acoustic efficiency of interphones, headsets and other equipment.

"Soundproof," rooms, personally used, have proved unreliable because vibrations, such as the reflection of a sound from a wall, have introduced false readings on indicators.

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## MUDDLING in High Places

It is time for men in Washington and London to stop toying with the problem of international trade. We of the democratic West are at a turning point in our economic affairs. A false step by either the United States or Britain could lead quickly to disintegration of trading between the people of the world as we have known it for the past hundred years. Recent meetings of diplomats in London and Washington have not lifted us out of this danger.

By two simple tests you and I can measure the sincerity of the men in Washington or in London who are trying to solve what they call "the dollar crisis."

One test applies to the British: Is Britain making an honest effort to re-establish itself as a real competitor in world markets?

The other test applies to us in the United States: Are we willing to see Britain re-emerge as a strong competitor in world markets—even in our own home market—and to help her do so?

Today, even though both countries have faced the devaluation test, the answer to these questions probably is no.

I

The situation we face is, in fact, unprecedented in every important industrial country of the non-Communist world, except Germany and Japan, production is above prewar volume, thanks largely to the Marshall Plan. Yet trade between nations is shackled as it has never been since the 18th century. And the shudders grow day by day. What is worse, two distinct trading areas—the dollar area and the sterling area—have grown up in the non-Communist world, and the gulf between them grows wider.

What kind of leadership have the United States and Britain had in the face of this crisis? President Truman late in August wisely checked the trans-Atlantic bickering over the dollar crisis. But Mr. Truman showed no awareness of the basic question that the American people must soon decide: Is the United States able and willing to generate trade balances without, as Britain did, in the 18th century?

What have British leaders offered us? Foreign Secretary Bevin and Chancellor Cripps called their September visit to Washington "one of the most important occasions in history." But they did not tell the British people, and perhaps do not *admit themselves*, that their Labor government must change its internal and external policies if Britain is ever to earn its living in a competitive world.

Admittedly, the problem Britain has faced since 1945 is a colossal one. But, in the face of its grave difficulties, what has Britain done? The working day was shortened. Welfare measures have not. High taxes have tipped天秤 in favor of Labor and capital have, owing to their present psychology of control and featherbedding. Government controls and government trading have hamstrung private initiative. Nationalization schemes have twisted politics into the struggle for industrial recovery.

Then the policies of the Labor government have made Britain's adjustment to its new position in the world immensely more difficult. But Americans who remember the dangers of an imminent breakdown to British socialism greatly exacerbate the problem. Virtually every country in the world, socialist or not, faces the same dollar crisis that Britain does.

continued on next page

We Americans must recognize that our economic strength underlies world trade as does Britain's weakness. World War II increased America's superior power to produce goods. It also made the United States more self-sufficient. Thus, while the world demand for American goods has risen, our demand for foreign goods, except for basic raw materials, has not increased. Today we sell more to every major area of the world than we buy from it—and yet we wonder why there is a dollar crisis.

It is time for us to recognize that there are two fundamentally conflicting pressures at work in the United States. One is our desire for a big surplus of exports over imports. The other is our desire for a system of free-floating trade around the world. We can not have both unless our taxpayers wish to subsidize our exports. Which do we want?

Cyril E. Caffer, chairman of the International Relations Committee of the National Association of Manufacturers, says, "The basic of the foreign trade policy is essentially that of reconciling our urge to export our surpluses with a reluctance to accept imports in payment for them. . . . The dilemma is an uncomfortable one to face."

## II

Here, then, are the basic questions that confront men in Washington and London. Does Britain really want expanding world trade or a high-cost welfare state? Does the United States really want expanding world trade or a large surplus of exports? So far politicians in Washington and especially in London have decided these issues because they are political dynasties.

If the people of Britain decide they want to regain their position as a competitive trader in expanding world markets, here are specific objectives that men in London should set for themselves:

*1. Lower government costs.* The British Treasury has asked for cuts of 3% in 1958. But a cut nearer 15% will be necessary, even if that means fewer government salaries and health services. Economic growth will never serve our costs come down while taxes take 40% of the British national income, including roughly 60% of business profits.

*2. Fewer government controls.* Only by removing controls and allocations (except on a few necessities) can Britain begin to return to prices fixed by competition rather than by government fiat.

*3. Stronger anti-monopoly legislation for both domestic and foreign. Britain needs a concerted drive*

against all forms of restrictive, high-cost practices. This drive should put teeth in the anti-monopoly act and supplement it with legislation to end restrictions imposed by trade unions.

*4. Less restrictive trading policies.* Britain should retreat gradually from its international barrier between governments if competition is ever to have free play in international trade.

Meanwhile, if we of the United States sincerely want unilateral world trade, men in Washington must face up to four problems and hammer out workable solutions:

*1. Use of the International Monetary Fund to back a devalued pound.* In time the Fund, in which we hold the controlling voice, might be used to promote convertibility of pounds into dollars.

*2. Help for Britain to expand war-created external debts.* This might mean support for London in getting a reduction of the war debts Britain owes India, Pakistan and Egypt, for example. To achieve such a debt reduction for Britain we might have to underwrite a part of a Southeast Asia recovery program.

*3. Encouragement of American investments abroad.* Such investments should be directed primarily into enterprises which will earn dollars, such as the development of new sources of raw materials, or which will make productivity abroad.

*4. Our own tariff barriers.* Our attitude toward this critical issue will be the acid test of how deeply we believe in the merits of free world competition.

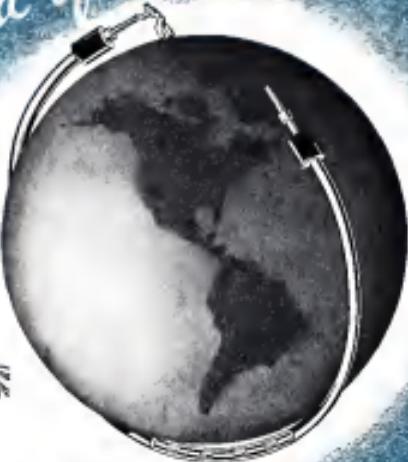
If we really want free, competitive trading between the people of the world, these issues must be met and resolved by leaders on both sides of the Atlantic. If we do not want to face these issues, then let us resign ourselves to a world ruled by those trading nests: the Command blue, the sterling area, and the dollar men. So far, Washington and London have muddled along, except in facing the devaluation problem. Clarity and courage are still needed.

*Sherman H. M. Hawley,  
President, McGraw-Hill Publishing Company Inc.*

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**TYPICAL APPLICATIONS**  
Engines Throttle  
Fuel Mixtures  
Superchargers  
Propeller Governor  
Passenger and Cargo  
Doors and Hatchets

**OTHER PRODUCTS**  
HYDRAULIC FUSES  
AUTOMATIC ENGINE CONTROLS  
HYDRAULIC REMOTE CONTROLS  
ELECTRONIC FUSE PANELS

DAYTON, OHIO • SANTA CRUZ, CALIFORNIA • MONTREAL, CANADA

## NEW AVIATION PRODUCTS



### Aircraft Pulley

No-Glu aircraft pulley, offered by the Farness Co., Cincinnati, Ohio, reportedly helps reduce possibility of spreading fiber after release, because it is briefly hot at afterglow instant flame is removed.

In company tests, old and new type pulleys were subjected to blow torch and both ignited. After flame was removed, combustion in new unit ceased immediately, while old pulley still was glowing brightly ten minutes later.



### Small Blow-Torch

Super Jet blow-torch uses fuel in tablet form, either than alcohol or gasoline. Offered by Westinghouse Co., Newark, Conn., lightweight unit is reported to produce temperatures up to over 2000° F. and applicable for soldering, annealing or hardening metal parts where heat, low flame is needed. Tablets burn about 10 sec. They are said to prevent oil based staining.



### Versatile Motor

Originally developed for aircraft purposes and dc motor, made by Bendix Aviation Corp., Ray Bank, Calif., can be used in other applications because of speed, torque and low weight.

Motor is designed in accordance with specification ASRM-40 and is available for operation on voltages from 12-60 v.c. Normally powered with AN capacitor, it is anticipated to be completely shielded to eliminate induced R.F. noise and is equipped with integral filter to suppress conducted noise that is guaranteed to be no louder than 15 db. at 55 to 77°C.

### Stronger Magnets

Development of two high strength magnet materials, Alnico 5DG and Alnico 7, by General Electric Co., Poughkeepsie, N.Y., makes possible use of smaller magnets in place of larger units now used in motors, instruments, magnetic separation and other industrial products. Alnico 5DG is said to have highest external and residual induction of any permanent magnet material.

Alnico 7 is claimed to readily tolerate operations above high temperature and forces are present, 45° C. rotation, protection and variable air gap designs. Material is stated to have higher eddy current force than any other Alnico.



### Lightweight Band Saw

Small, Model 49A, metal cutting band saw, offered by Weller Mfg. Corp., 101 Stevens Rd., Three Rivers, Mich., is specially designed for use in small shops and for general plant work.

With a 0.5 x 60-in. blade driven by its half-horsepower motor, machine is capable of cutting 1½-in. diameter round pieces and 3½ x 3½-in. rectangular shapes. Weight above drive mechanism is 36 lbs. Weight of saw and base is 150 lbs. Saw also is equipped with quick action vice and adjustable blade stops. This type offers a wide wheel span so guide and blade bearings load and had no welded steel and mounted on tubular steel legs. Weight only 115 lbs., yet has 44 x 24 in. bed area and height to top of bed of 24 in. Floor space required is 165 x 35 in.



### Strong, Light Hose

Braked, epoxy reinforced hose, stated to exceed both strength and greater flexibility with light weight, is available by U. S. Rubber Co., Hackensack, New Jersey, N. J., for hydraulic, lubrication, fuel oil, automatic fluid and other petroleum distributor.

To be marketed in Preflex Fuel Oil Distributor Fleet, product has brass N male and inexpensive two threaded, machined copper when for connection of static line cover is Niagara to withstand cold temperatures, swelling and abrasion. Sizes available are 3, 4, 6 and 8 in.

Previous shown aircraft lighting fixture developed by Fyrone Co., Ltd., Finsbury, Middlesex, England, described on Page 31 of Aviation Week Oct. 1. Illustrations even ready used with the story was that of an American truck built by Clinton Corp., 307 N. Michigan Ave., Chicago 1, Ill., described in this series Feb. 21.



SIKORSKY AIRCRAFT  
140-10 THE LEAD IN DESIGN OF MODERN AIRCRAFT EQUIPMENT



Ten years ago last month Igor Sikorsky flew for only a few seconds at an altitude of less than six inches. Yet he made aviation history. This was the initial flight of America's first successful helicopter, the VS-300. It is the beginning of a story of leadership.

Less than 2 years later, the VS-300 became the world's endurance record holder and first to execute amphibious operations. The Army Air Force was interested. To meet its specifications, the research and development staff pioneered an improved type, the XI-1. It was the first successful military helicopter and became the first to go into quantity production.

Only Sikorsky helicopters went to war. A total of 1200 H-1s, H-2s and H-3s were built up to V-J Day. Many of these served in various theaters of operation with the U. S. Army Air Forces, Navy and Coast Guard as well as the British Royal Navy and Air Force. During this period a Sikorsky helicopter was the first to land and take off from shipboard. And people across the country began to read about hazardous rescue made possible by this versatile aircraft.

Since the war, Sikorskys have continued to make exciting history - first to carry the mail, first to explore the uses for helicopters in agriculture and industry, first and only helicopter to hold all 7 major international records.

Today Sikorskys bear the insignia of every branch of the Armed Services, and are being used for an ever increasing list of assignments heretofore considered impossible or impractical with any other type of vehicle.

This is still only the beginning. The pioneering goes on and on.

SIKORSKY AIRCRAFT

# here it is : THE NEW ADEL 3000 PSI NON-INTERFLOW 4-WAY SELECTOR VALVE\*

- The first*
- ★ EXTREMELY LOW HANDLE LOAD
  - ★ 3000 PSI ★ NEGIGIBLE PRESSURE DROP
  - ★ EXCITING LEAKAGE CHARACTERISTICS
  - ★ MORE THAN MEETS PROPOSED AN REQUIREMENTS
  - ★ MINIMUM WEARING PARTS

Non-Interflow  
Selector Valve

#26337



#26306



#26303



#### 4-WAY SELECTOR VALVES

TOTAL PRESSURE DROP:

15 psi at 2 gpm flow,

35 psi at 3½ gpm flow

HANDLE LOAD:

22 inches at 1500 psi,

38 inches at 3000 psi

1 Drop per min. normal

leakage rate at 3000 psi

15 psi at 2 gpm flow,

35 psi at 3½ gpm flow

HANDLE LOAD:

22 inches at 1500 psi,

38 inches at 3000 psi

1 Drop per min. normal

leakage rate at 3000 psi

#### 4-WAY SELECTOR VALVES

TOTAL PRESSURE DROP:

50 psi at 10 gpm

HANDLE LOAD:

30 inches at 1500 psi,

40 inches at 3000 psi

1 Drop per min. normal

leakage rate at 3000 psi

Here's Adel's new line of lightweight 3000 psi, non-interflow 4-Way Disc Type Selector Valves with extremely low handle torque, negligible pressure drop and excellent leakage characteristics. More than meeting the latest proposed AN Specification requirements, they represent the most advanced engineering design for 3000 psi internally-operated Selector Valves. Non-interflow design completely eliminates all undesirable sacrifice when changing shaft positions. No moving packings under system pressure. Hydraulic testing is accomplished by hardened surfaces that are optically flat within one eleven-thousandths of an inch. Available with or without detents in 15°, 30°, 45° and 60° line runs with a wide variety of flow patterns. **ADEL PRECISION PRODUCTS CORP.**, 10777 Van Owen Street, Burbank, California.

\*Patent Pending

ITEM  
1.  
2.  
3.  
4.

ADEL

ADEL PRECISION PRODUCTS CORP. • Burbank, Calif. • Huntington, W. Va.

Canadian Representative: RAILWAY & POWER ENGINEERING CORPORATION, Limited

## PRODUCTION

### Design Compromises Cut in Orenda

Production scheme for new Avro Canada turbojet geared to maintain high standards specified by designers.

By Irving Stone

**Milton, Ontario**—An analysis and efficient development program highlighting the close relation of production to design is well underway at A. V. Roe Canada Ltd.'s Gas Turbine division.

It is a striking example of the Designer's intent toward a substantially greater measure of industrial self-sufficiency. And one of the most important aspects is the opportunity given to the Canadian and general industry to contribute to the development of the basic engine.

Adel's gas turbine division has extensive technical knowledge through a sound and effective approach to the complex problems in the turbogear field. It has literally learned its design and production know-how "from the ground up."

► **Background**—Roots of the program go back to Canadian jet engine activities which began in 1945 at Winnipeg with the setting up of a cold test station by the National Research Council to test British gas turbines in the summer of '45. This was followed by the formation of Turbine Research Ltd. to continue study and development of both aircraft and industrial jet turbine prototypes, and the Winnipeg cold-test station became under Tudor's jurisdiction.

In the spring of '46 Tudor was closed and A. V. Roe undertook a contract to design and develop specific turbines for the RCAF. Majority of Tudor's personnel, about 300, were carried over to participate in the new project. Today about 10 times that number are on

play. The first product was the Chipman turboprop, initially run in March '46. Design of the Chipman was begun in '46, initial operation was in February '48. The engine is no scaled-up version of the Chipman. It is a completely new design, closely controlled production size to achieve greatest operating efficiency.

► **Design and Production Philosophy**—Early in the program, Avro Canada technicians guiding the design and production phases realized the necessity of stressing the quality of parts for maximum寿命.

Following this basic requirement, they realized, would result in a man-

agement of compromise with design dictated in the experimental stage. Then, at a later date, exhaustion of these high standards could lead to a loss of lower production costs, with full knowledge of the effect it would have on engine efficiency.

Accordingly, ploughing behind the Orenda project is to attain maximum self-sufficiency—not placing too much dependency on outside contractors. This leads to the development of extensive programs by the contractor and general restriction of established manufacturing techniques. Aim is to make all parts except specialist tools as simple, strong, etc.

► **Develop Own Machining-Cast**—example in blade fabrication. Avro designed and built numerous machines and developed unique processes for casting and machining turbine and compressor blades.

An ingenious photograph-type grinder was constructed for making master blades and forging dies. Avro believes that no similar machine is used elsewhere. Developed to make a master of a single blade, the dies can be fashioned before finishing, only necessitating a light polishing operation, and given a greater measure of accuracy than normally attained with hand-drawing methods.

Whereas basic techniques are more or less common to all precision casting processes, there are considerable variations in quality of the product as a result of differences in the processes. And it was with this in mind that Avro technicians developed their own methods. They started from scratch and just learned the art of investment casting, which, they find, gives qualities of surface finish, physical properties and strength of form equal to or better than that offered by highly skilled fabricators.

► **Quality Control Award**—Avro had its head in the control of parts which were sub-contracted. That, for major engines such as compressor housing, casings and bushings (between bearing and compressor), it insisted on the development of manufacturing techniques to achieve the close tolerances required. For this purpose, it built its own pattern and set up a series of pattern fixtures to consistently

higher than found in commercial practice.

Looking to the future, Avro's intention is to move with general contractors.

► **Artist's Role**—An artist who needs help in developing a suitable technique for a particular part, thus saving time and ensuring the quality of work on initial plates.

► **Research**—An economy must be made at a clutch on parts quoted on a production basis by subcontractors.

Despite the many phases of the engine development which Avro has undertaken to do on its own, it feels that costs to date have been inherently less than those other companies' hardware partners.

► **Personnel**—Placing the work in the avro turbine engineering plant are Paul B. Dilworth, manager and chief engineer; and Whitwell Boyd, assistant manager and chief designer. Avro's work on the production survey are Maurice G. Nic, manager, and Earl K. Brownridge, assistant manager.

## PRODUCTION BRIEFING

► **Industrial Instruments Corp.**, formerly in New York City, has completed its move to Raleigh, N. C. It has completed eight units of its prototype electronic automatic vibration tester and performed static load tests on several aircraft jet engines.

► **Potashol Aircraft**, Montreal, has completed the sale of buildings and land at Longueuil, Quebec, to Laptid Victoria of Canada for \$600,000.

► **Avco Albatross Corp.**, obtained agreement from "wholly-owned affiliated entities" to a proposal for re-financing. Potashol involves a potential stock issue of not less than \$300,000,000 of which \$200,000 would go to develop royalties in compensation for claims relating to the time and a proposed \$200,000 KPC loan would be used to working capital funds.

► **De Havilland Aerospace Ltd.**, Hatfield, England, has recently acquired some American Hadlock "strut sweep" presses of the type recently purchased by North American and Boeing for use in forming metal aircraft wing and fuselage parts.

► **Curtiss-Wright Corp. Airplane division** at Columbus has been awarded an Air Force contract to repair missing drives in P-80s and F-84s. An All Material Canadian flight training Program is expected to be extended to the T-34 and B-50.





## New Curtiss Propeller

FOR THE NEW L-749A CONSTELLATIONS

A new Curtiss propeller has been approved by the CAA for unrestricted operation on Lockheed L-749 and L-749A Constellations. This propeller's high safety factors provide improved take-off, climb and cruise speed at higher gross weights, and its rugged construction insures long service life.

Other improvements Curtiss features incorporated in this new pro-

peller are... reliable feathering... resonance absent for smooth, air-controlled landings... automatic gyro orientation for passenger comfort and ease of control... a further redesign of Curtis-Wright's leadership in the field of aircraft propellers.

The acceptance of this new propeller, after extensive static and flight testing... under conditions surpassing the severest stresses of commercial... is another evidence of Curtis-Wright's leadership in the field of aircraft propellers.

**CURTISS** ELECTRIC PROPELLERS  
PROPELLER DIVISION CURTISS-WRIGHT CANTON, NEW JERSEY



## SALES & SERVICE

### CAA May Finance Spray Plane

Bids to be asked on production of agricultural aircraft developed by Fred Weick if flight tests show promise.

By Alexander McMurtry

Tentative plans to let government dis-

solve contracts to private aircraft manufacturers on a competitive bidding basis, for "a few prototypes" of the new agricultural aircraft under joint development by CAA and the Department of Agriculture at Texas A & M College, were revealed last week.

CAA Administrator Del R. Strother disclosed that the first flights of the new experimental plane, designed by Prof. Fred E. Weick, head of the Personnel Aircraft Research Center at the college, are expected probably by May 1950.

**Initial Tests**—After passing tests of the plane and the dispensing apparatus which is being developed simultaneously for aerial spraying, dusting, seedling, etc., the additional planes will be made.

"It is felt that the work appears to warrant," Strother said, "the public interest in agriculture, holding competitive, in building a few prototype planes, and also in getting some useful flying training and sprayer information. Although unavailable, work up with the first aircraft will not release or make available information which is a cutting edge of competitive engineering technique and which is strictly research and reference."

**Simple Planes**—"I want to emphasize that the agricultural aircraft project is one of research and development. We feel that there is a great potential in the application of agricultural aircraft of the kind adopted by high-flying aircraft, particularly at low speeds, etc. A large portion of dusting, seedling and spraying is being done with military transport airplanes and even with the almost 30,000 half-horsepower planes."

"We do not feel that the CAA Administration, and I think, I can speak for the Department of Agriculture also, are overly interested in providing the 'fertilizer agent' as we try to make it through agricultural aircraft but rather in developing of its own agricultural plane but expect selected interest next year in its Arizona Station, modified by a western company as a dusting and spraying. Most American and now in this work, are California and Idaho, two areas comparable to the Piper J-3 and PA-11

transcon. Arizona likewise has conducted a survey indicating a wide diversity of opinion between farmers and grain operators on the type of plane they want. Survey indicated to农会 ensures that no one plane would meet a sufficiently general demand to make it such a large market.

Piper has been close consulted about its new development but presumably it will follow along the lines which the company has said successfully for agricultural modification, probably with either 90 or 115 hp. engine.

**Requirements Analysis**—Analysis of the different requirements for agricultural planes indicates that for a light aircraft on the West Coast, for high altitude work relatively high-powered aircraft which can carry a large load are desired; as smaller, lower-spray capacity in the East, the low-powered biplane, with low wing loading and ability to get in and out of small fields readily, are preferred.

It is understood that the Weick plane will be designed for a 115 hp. engine, but that it will be started off for use of larger gasoline engines up to 160 hp. in order to accommodate operators who want more power.

**High vs Low**—Introducing incident on the Weick design is the fact that it is for a low wing monoplane, while all of the three companies mentioned as probable principal competitors for an agricultural plane have an extremely high-wing monoplane designs, and have never produced flying planes to satisfy them.

**Cessna Aircraft Co.** has no current development plan for an agricultural plane. Spraying and dusting equipment for Cessna 180 and 180 two-place, and 170 four-place, is available from the Traylor Company, Waukegan, Illinois distributor.

Kirby

pull

by the company among distributors indicated a desire did not consider that there would be a large market created in a specialized agricultural plane to warrant its manufacture at this time. "We are not working and working at present," was the summarization of the Cessna position.

**Aerospace Corp.**, Middlebury, Ohio, would be interested in a government-subsidized competition to build a rural quantity of agricultural planes, if all the "helicopter convertible aircraft" in not let out too early. The company has no place for development of its own agricultural plane but expects selected interest next year in its Arizona Station, modified by a western company as a dusting and spraying. Most American and now in this work, are California and Idaho, two areas comparable to the Piper J-3 and PA-11

transcon. Arizona likewise has conducted a survey indicating a wide diversity of opinion between farmers and grain operators on the type of plane they want. Survey indicated to农会 ensures that no one plane would meet a sufficiently general demand to make it such a large market.

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**Requirements Analysis**—Analysis of



**but parts  
machined by  
NASCIN  
are right**



We are so thoroughly  
convinced that part as  
well as machine  
is the 0008.

American Non-Guns Division is an experienced contract manufacturer. Our experience as production runs of parts—in any metal—qualifies us to 0008, and in some cases, to 0007. We have 40 years' experience. We are currently serving leading concerns in the aircraft industry. They have found our service profitable. You may also.

When you have work that is hard to do economically—or just plain work—we want it. Write for descriptive folder.



## BRIEFING FOR DEALERS & DISTRIBUTORS

**PROPELLER PROBLEMS**—CAA technical officials expect to ask revisions soon in Civil Air Regulation Part 14, dealing with propeller certifications, because of recent problems which have developed with composite material lightplane propellers. Aviation regulation has been unchanged in its basic form for many years, and all changes and modifications were added word by word. In recent vibration tests, new materials and various combinations of wood, metal and plastic in blades, shanks and hubs, always had changed. CAA technical think that a lot of propeller difficulties that show up after certification, could be caught in certification if requirements were changed.

**SMOKING CONTROL**—Bill to authorize CAB to study need for some control on the smoke of aircraft to promote safety in air navigation was presented in the House of Representatives by Rep. Carl King (D-Calif.) and will now be referred to committee. The bill contains no specific language, but authorizes the Board to investigate and for control of discharge of smoke contributing to formation of smog, best means for such control, and to report back to Congress with recommendations for legislative action to influence the controls.

**NON-SCHEDULED MEETING**—CAA Advisory Committee on Non-Scheduled Flights was to get together with CAA regional heads and Administrator Del Barrow last week at Oklahoma City for a combined meeting and inspection of the CAA's training center there.

**OVERLOADED CLIPPER**—An overload may have been the cause of the crash of a charted 115 hp Piper Clipper in the six miles from Princeton to a flight from Boston. Daniel Lucas, Woburn, Mass., of Cape Cod Flying Service, reported by radio he was "going in" just before the plane went down. With him on the flight were a mother, her two small children and another woman passenger. All were drowned.

**ACCESSORIES PANEL**—At the final Nov. 11 session of the Aviation Distributors and Manufacturers Assn. meeting at French Lick, Ind., manufacturers representatives will be called upon to present a panel on "increasing safety of general day aircraft through use of accessories." Fred Lee, of R. M. Halligan Corp., Linden, N. J., will have on his panel representatives of companies making instruments, propellers, enclosed landing gear, radio, aircraft and aircraft lighting, landing flaps, slot, aeronautical equipment, etc. An annual large part of the meeting meeting beginning Nov. 9 will be taken up with conference between the various trade associations and their distributor, Richard Baumberger of Seacrest Corp., ADA's president, will preside.

**AIRPORT COVERAGE**—Dr. Leslie A. Evans, director of the Civil Service Bureau of Aviation thinks that the U. S. airport picture is getting encouraging numerically. He estimates there are more than 6000 airports in the U. S. and that if properly located, 5500 fields would give the nation a "possibly adequate landing area coverage." He pointed out, however, that the distribution of the present airports is still grossly bad. The roads, railroads and airplane plants, that is, the number of large airports is not adequate, and that there is a decided concentration among airports and ground transportation facilities. He considers that the more frequent construction of slow-in-airports such as those in Chicago, Milwaukee, Cleveland and Oklahoma City, is a healthy sign of improved service to the private flier and looks to the increased landing gear and tricycle landing gear to bring about more airfield fields which can be located more conveniently and less expensively.

**PYTER 700 CLIPPERS**—Ike Miller, Pyter sales manager, says sales by Pyter of the first 115 hp. Clipper will total well over 700 this year. The Clipper which has been a favorite in the quiet general aviation market, has been helped along by the Pyter organization's back and the Pyter's own unique design. It has been flying the long hauls day in 1946. The probably the completion for Pyter's more ambitious development plan has a four-engine executive transport and a new agricultural plane. Pyter is reported elsewhere in this issue. There are also reports that Pyter has a new smaller all metal experimental craft well along in development stages.

—ALEXANDER KESTREL



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**Your planes pay off in the air  
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Douglas Aircraft Company, Inc., Santa Monica, California

MORE PEOPLE FLY MORE PLACES BY DOUGLAS



GENEROUS FLAP area gives Comet landing speeds comparable to piston aircraft. Lower position of Comet noselets keeps part of flap.

## DH Comet: British Firm's Private Gamble

Jet transport center of airline interest, while future is dim for plane government said carriers would need.

By Robert Hite

HATFIELD, ENGLAND—Perhaps the most significant fact about the de Havilland Comet is that it is probably a product of private enterprise rather than government subsidy.

Indeed, the fast transport to take the air specifically designed for turbine power was developed more along the traditional pattern of U.S. aerospace than that of the British government financing of prototype development. According to de Havilland officials, the Comet was developed by the de Havilland enterprise as a privately financed venture at a total cost of the \$12 million usually paid by U.S. manufacturers at the conclusion of a long-term government contract. No subsidy—Compared to general government de Havilland attack paid out there is no British government money in the direct development of the Comet. Nor was the Comet built to meet any government specification for transport aircraft.

The privately-developed Comet, which has set the international aviation world ajar, offers an interesting contrast to the British government's idea of the value of the jetplane—the past 280,000 lb. eight-engined Bristol Britannia I which has already cost many one of the £2 million Britons net six dollars. If and when the 100 passenger turboprop version of the Britannia ever gets around to making a weekly trans-Atlantic crossing it is likely to find a

single Comet carrying twice its capacity load for the same period at considerably less cost to both passenger and operator. As a further hedge against the Comet, the Ministry of Supply has financed design studies with Vickers, Rostal and Hawley Page for a long range Ruster type that could be built to do the Comet's job if necessary.

►Comet History—Indeed, the Comet history begins when the original British government laid down a specification for a 200 mph airliner from Atlantic at mid-plane. De Havilland was given a Ministry of Supply contract for high speed flight research preparatory to the final plant project. The DH program resulted in the three supersonic to less than 100 mph all-metal planes which became the first British supersonic aircraft. Each reached the 100 mph mark during flight much as the USAF-NASA program with the Bell X-1 and Douglas D-558 appeared on the United States. It was during the DH 105 project that young Geoffrey de Havilland was killed when the second model he designed in comparatively trouble-free DH test pilot John Barry failed the final made to March 1. As a result of this accident, de Havilland decided that the British specification for the airliner must place strict life demands and sought to interest the Ministry of Supply in a jetplane passenger transport of lesser speed and more conventional design.

The Ministry agreed to allow de Havilland to proceed with the new jetplane transport project at their own ex-

pense and gave approval for use of relatively light materials for the Comet prototype. It also agreed to buy two Comets for experimental use if the de Havilland could demonstrate its prototype performance. British aircraft engineers agreed upon 14 more on the same terms. These 14 Comets were contracted for at a guaranteed price based on quantity production. The price to MOD and BOAC vehicles only a small fraction of development costs. To recoup its development costs and break even on the project de Havilland will probably have to sell at least 300 Comets.

►Widened Chances—Both MOD and BOAC contracts carry a clause allowing both government agencies to withdraw from the project if de Havilland fails to meet either guaranteed performance or price. If so, de Havilland can not sell at both guaranteed price in effect and receive funds from whatever agency. Guaranteed performance is believed to be cruise speed of 900 mph at 45,000 ft. with a range of about 3500 mi.

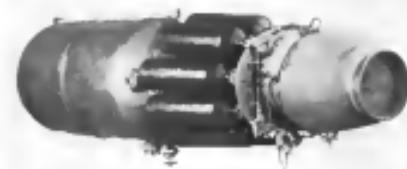
This picture is in sharp contrast to that painted by some Americans who explained the development of the Comet as another triumph of the "old guard." British aircraft industry and contend that no U.S. jet transport can be developed without government funds or a guaranteed contract. If anybody thinks the British manufacturers consider an order for 30 planes a guaranteed order, they should listen to the words of dismals coming from British manufacturers over an offer of British European Airways to buy 15 of a喷气式短途客机 type it was done



WITH LEADING EDGE SLATS fully open and flaps partly down, the Comet displays wing profile during climb. (Menzel)



PRODUCTION LINE set up at Hatfield already has four flying test Comets for BOAC and RACAC prior to first flight.



SPIRELE motor for takeoff assist gives 1000 lb. thrust for 12 sec.; is boosted when



COMET cargo between the two Comets





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consideration would be "will it be the right job for the industry?"

► **Speed Problem**—He said that coupling meeting the desirable factors of speed, load of vibration, and maintenance costs may be the very realistic handle of traffic delay, which even now presents serious problems with an "open" approach.

► **Other Obstacles**—Also, he said of jet aircraft will pose serious problems of landing and landing on the ramp.

Landing and supply facilities at air ports are another consideration. Work jobs to support certain craft under present conditions, fuel supply would not be sufficient to service them.

► **Initial Planning**—Richterbaumer candidly observed that he "never saw a transport job good before two years of operation on the surface."

He said that Eastern would use jet liners if the manufacturer would pass initial operating costs. Under this arrangement, he said, the craft would be tried for a 6-12 month period under conditions he thought it should be operated for the airline public.

► **Government Rule**—Richterbaumer the Government's obligation to the jet transport picture. Richterbaumer said that it would have to support development of a prototype, because an airline or group of airlines could afford to undertake the venture.

He believes that the Government should appropriate \$75-100 million, get specifications from the airlines, reflect two or three of the better name carriers and give them the green light. He feels that one of a jet liner should not exceed \$1 million, but that the manufacturers would probably want closer to \$1 million for the craft.

### SHORTLINES

► **Alaska Central Airlines**—CMG has approved a proposal whereby the Alaska Regional Service Corp. will become a 90 percent participant with a finance bank in a \$100,000 loan to the carrier.

► **Brazil**—Decided by the DC-4 forest service between the U.S. and Peru. Four Douglas aircraft will be used scheduled using combustion passenger/cargo craft with four 25 passenger seats per cabin.

► **British Commonwealth Pacific Airlines**—Last 360,000 pounds shipping during its first complete year of operation. Ownership of the line is held jointly by the governments of Great Britain, Australia and New Zealand on a 35 percent, 35 percent, 30 percent ratio respectively. The three governments have been asked to make grants for the deficit in connection to their shareholdings.

► **British European Airways**—Has announced fare reductions up to 30 per-

cent between London and many foreign stations for British military personnel and their dependents.

► **Bruehers**—He said the franchiser stockholder in Air Cargo, Inc.

► **Northwest-Catalin**—Catalin passengers to cut upper berth rates in transoceanic service. Standard flights to \$25 and lower berths rates to \$10. Company rates a straight \$99 charge for berths. NWA director base rate decreased for all regular quarterly dividends on all 4.6 percent convertible preferred stock.

► **Pan American**—Will commence daily Stratocruiser service between New York and Honolulu Nov. 3. Pan and other American flag carriers operating to Panama have transferred their operations from Albrook Field, Canal Zone, to the new Tocumen National Airport.

► **Sabena**—Reported an operating loss of about \$388,000 in 1948, but the deficit was compensated by a profit amount from a special position made in 1948. Current bonded 100-111 percent and had a 62 percent interest and factor in 1948 compared to 100-127 passengers and a 67 percent load factor in 1947.

► **Scandinavian Airlines System**—Has reorganized direct DC-3 services between New York and Hamburg, Germany.

► **Taiwan Republic Airways**—The New Zealand carrier has received the first of four new Short Solent flying boats. Coming 45 passenger air taxi decks, the craft will be used on the Southern Archipelago run.

► **TWA**—Trans-Atlantic cargo handled during the last eight months of 1949 amounted to 70 percent of the total general cargo tonnage. Purchased cargo totaling 3,900,245 ton miles was up 45 percent and purchased cargo tonnage was 900,975 ton miles, rose 35 percent over 1948.

### CAB SCHEDULE

On the 10-19th argument in New Britain series case. District court of 4th Cir. held that the trial court had erred in refusing to accept the defense's offer of a stipulation that the parties would abide by the trial court's decision.

On 10-19th argument in Board of Transportation of Arkansas case. P.D.C.-Arkansas Dept. of Highways v. Board of Transportation of Arkansas.

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On 10-19th





# LETTERS

## Edison Detectors

In the "Aviation Observer" column Sept. 15, you state that "American fire and smoke detectors are shielded by plastic cladding and carbon dioxide detectors." I am sure the most widely used detector of all is the Edison Thermocouple Fire Detector.

The Edison Fire Detection Systems which we have manufactured and supplied to the aircraft industry for many years utilize thermocouple detectors exclusively and are not subject to damage which shortens their life. What makes the Edison detector so reliable is the fact that the Edison Fire Detector is used by nearly all major airlines conforming to all CAA regulations and is approved by the U.S. Air Force and U.S. Navy.

I hope that in your column you will acknowledge our work who may have been misled by your statement.

**J. E. Davis**  
Associated Fire & Smoke, Manager  
Instrument Division  
Thomas A. Edison Inc.  
West Orange, N.J.

## H-O & Rockets

In reviewing the article, "Revising Maintenance for Rockets," in Aviation Week May 18, we find that the service dealing with H-O rocket boosters promote assisted regeneration of these components which makes the value of this material all the more valuable.

We, therefore, would like to advise you of its properties and clearly say microscopes which may have a seat in to support claims surrounding boosters.

The engineer of the Belloff Electro-Mechanical Co., Inc. and the original author of the article has done a fine job in storage of the quantity of H-O boosters. His procedure can be handled with complete safety if certain established usage rules are followed.

The experience he has compiled, for example, can be of great benefit to the industry. For one, too, it guides us in our consideration "danger" posed by rocket boosters. This "danger" presently creeps with the ever more growth of experience and knowledge concerning its use and introduces cost in its handling.

The T. C. G. chose hydrogen peroxide as a storage liquid for analytical purposes. It is considered no more difficult to handle or transport than many common, non-toxic chemicals.

Ninety percent hydrogen peroxide is not explosive and is suitable to shock except when under extremely high pressure. It decomposes to water and oxygen. It is considered safe both by the U.S. Board of Mines and the Marine and Aviation Bureau of the U.S. Navy.

In addition, F. Edelmann et al. in "Chemical Propellants," which appeared in the Journal of Engineering Chemistry, H-

313, 1948, described shock sensitivity to which they performed in the absence of the usual laws.

(A) 90 percent hydrogen peroxide at atmospheric conditions was unaffected from a range of 180 yards to 1000 feet. gas flow, 1000 ft/min. 50° C. other cause pressure and secondary ignition. The only damage caused was the portion of the container walls.

(B) A piston driven upon a sample of 90 percent hydrogen peroxide by a 200 gm. hammer through a distance of 150 cm caused no detonation.

(C) A 2000 gm. jet of air caused 90 percent hydrogen peroxide at the closed end of a 1/2 in. diameter tube to pipe and no detonation on impact.

Hydrogen peroxide stored in an open aluminum drum or tank is handled by the same methods as any other liquid because of the heat effect. One should not on all lots of 90 percent H-O, as in heat a sample at 112 degrees F for 24 hours. 80% is plasma even though. The cold effect is in a light decomposition of about 2 percent strength loss for the test period.

Patent No. 2,437,102, this is the last for a number of years has stand and handled at half of the Belloff Electro-Mechanical Co., Inc., at ambient temperatures ranging from -5 degrees F. to 100 degrees F. with no more than a few minor losses in permanent surface spalling.

Finally, the selection of materials of construction for the rocket boosters has been storage of the quantity of H-O boosters by design principle is no longer a preservation problem. We have considered the common cost availability of a large number of solid state materials for the purpose.

Lamentations of space-particle insulation are not justified. We believe that this research will contribute to a fuller appreciation of the potentialities of hydro peroxide as an oxidizer for rocket motor and rocket uses and that it will go far to dispel the apprehensions being expressed as to whether hydrogen peroxide is "safe" for use.

**NOV. 5, 1958**  
Special Projects Dept.  
Belloff Electro-Mechanical Co., Inc.  
Bellfont, N.Y.

The article was a summary of an address made before the S. A. E. in New York City on May 20. Fred Zwicky, former research engineer of the Goodyear Aircraft Corp. and G. C. Ross, aircraft chief engineer of the Belloff rocket department. Dr. Zwicky retires.

"It was not my intention to denigrate the application of hydrogen peroxide in rocket propellants. After all, just as much can be said for any other propellant and people's handled problems laid to its head. However, it is often difficult to measure these conditions, especially

what a rocket is really an ordinary to, etc. as applies, and it better handled by personnel who may not know what the safety margins are. Also, the reliability of a larger system, and associated safety or fragility is possible, it may be difficult to construct the entire system of materials used in one another. We certainly have no objection to your pointing out that poor hydrogen peroxide can be handled satisfactorily in the paper equipment." —Ed.)

## Bevo Dissents

I have noted your editorial, "Dangerous Fatalism," Sept. 17, P. 9, referred to Bevo dissents. I am sure others were lost in an accident in the Thorpey Valley, Pa., area, but I am sure that one that could profit the least. With that in mind, if a safer way does not lead out there it should do so.

I do not agree with you, however, that the Northwest Air Express no longer seems any safer than previously. I think they should be held responsible. In my opinion, the only difference from a spectator and their management is that spectators should be concerned on that basis if anything else.

I am not prepared, or do I have all the facts before me about things that have been developed through recent improvements and changes that I can't claim to know, but I am sure that they would still do considerably.

The fact that it is a big show and that we point well compensated engineers have the opportunity of competing against our effort for price must seriously affect us to strengthen the evidence.

Finally, the development of reciprocating and free induction and induction went a long way in leading out World War II as basis, and if allowed to continue can and will contribute handily to a sound industry in this country in perspective and in general safety and reliability.

Therefore we should let loose to pass the long-haul engines and factory test points to build and fly our airplanes. Surely they can do this job, but the job definitely will not be good in as far as we have the size and span of the aircraft and duration of flight time. The time is now. Let's seriously develop the spirit of free enterprise, safety and competition.

There seems to be still a lot of argument

pro and con about as shown, and I for one am convinced that good as shown have a definite place in our industry and I think we should accept the fact and in short follow pro and produce better and safer as shown.

**ROBERT HOWARD**, President  
Howebee Flying Service  
Charlotte, N.C.

"We thank Farnam Bros.' audience of May 20, 1958, for their interest in the 'We Four' talk, otherwise as you all know, 'Don't go away, please' doesn't fit in. But go away, please, before Farnam's flight has suffered serious of mistakes. Why won't accidents? Aviation needs you, alive, for a long time." —Ed.)



**Col. Mark J. Meldel,**

Vice President in Charge of Operations,  
Scandinavian Airlines System, Inc.

"Axelson-built superchargers and other assemblies for cabin pressurization are used, with excellent results, on all the Scandinavian Airlines Douglas DC-8's. They have played an integral and important part in the worldwide operation of SAS, extending from Stockholm to New York, South America, Africa, across Europe, and to the Near and Far East."



Axelson aircraft components—hydraulic landing gear—cabin superchargers—gear and gearing mechanisms—are recognized around the world for highest precision quality wherever military or civilian planes fly. Axelson's complete mechanical facilities, expert craftsmanship and rigid standards of exacting production are augmented by a competent engineering staff experienced

and capable in helping aircraft manufacturers develop component parts for tomorrow's planes.

Through the years, Axelson has been noted as one of the country's foremost manufacturers of heavy duty precision engine lathes and gauges. Hundreds of these Axelson lathes are currently in use by the aircraft industry.



**AXELSON** *Aircraft Division*

AXELSON MANUFACTURING COMPANY  
6700 South Boyle Avenue, Los Angeles 15, California



MCDONNELL BANSHEE\*



BOEING B-50



LOCKHEED CONSTELLATION\*



PIASECKI HELICOPTER



BOEING STRATOCRUISER\*



CONVAIR B-36\*

MCDONNELL PHANTOM\*



MCDONNELL XF-88\*



BOEING B-47 STRATOJET\*

Gears, power units, actuators produced by  
Foote Bros. are today playing an important part  
in the successful operation of many of the  
nation's leading aircraft and aircraft engines

FOOTE BROS. GEAR AND MACHINE CORPORATION  
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